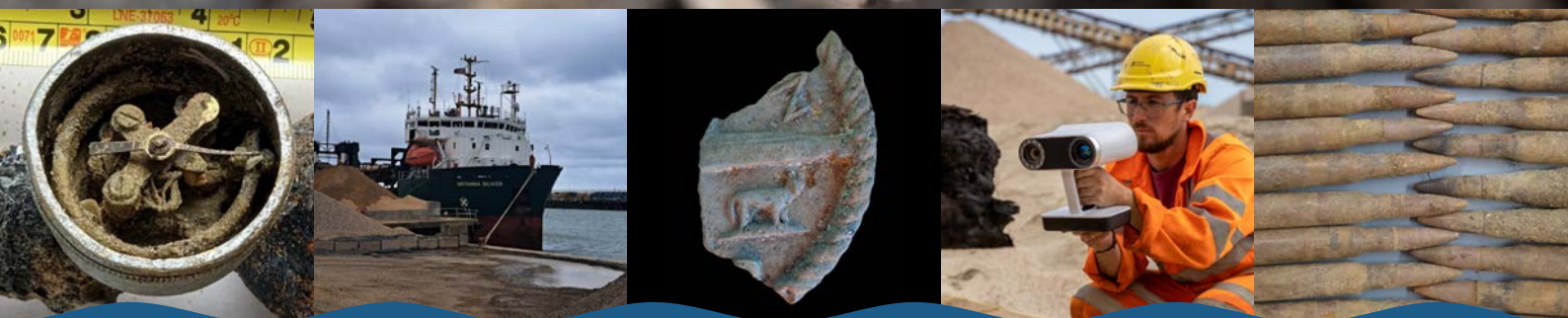


British Marine Aggregate Producers Association,  
Historic England and The Crown Estate

*Marine Aggregate Industry Protocol for the Reporting of  
Finds of Archaeological Interest*

# Annual Report to BMAPA 2022-2023

March 2024



*Page 1: Ben Saunders (Wessex Archaeology) at CEMEX's Denge Quarry, cleaning the remains of the Dungeness Wreck. See Pages 12-14 for more.*

Marine Aggregate Industry Protocol for the Reporting  
of Finds of Archaeological Interest

British Marine Aggregate Producers Association,  
Historic England and The Crown Estate  
**Annual Report to BMAPA 2022-2023**

March 2024

Prepared by





## Protocol background

The Marine Aggregate Industry Archaeological Protocol (the Protocol) is in place to ensure the protection of submerged cultural heritage that may be discovered during marine aggregate industry dredging works.

Prior to a licence being granted to dredge an area, an intensive investigation is undertaken to identify potential archaeological material on the seabed. Using geophysical and geotechnical survey and analysis of available records from various sources, archaeologists identify known and suspected sites of archaeological interest within proposed aggregate extraction regions. The known sites are protected through Archaeological Exclusion Zones (AEZs) to ensure that no harm comes to them through dredging activities. Even after this level of investigation, unidentified sites and especially individual artefacts may still be found during dredging works or within dredged cargoes. In response to this, the Protocol was proposed to define a framework through which archaeological material could be identified, reported, investigated and, crucially, protected. The Protocol ensures that any items of potential heritage importance recovered during aggregate dredging, whether encountered on the seabed, on a dredging vessel or, more commonly, at a wharf after a cargo is landed, can be properly reported, assessed, recorded and archived. In some instances, further mitigation or monitoring may be required.

Wessex Archaeology drafted the Protocol in 2005 on behalf of English Heritage (now Historic England) and the British Marine Aggregate Producers Association (BMAPA). BMAPA member companies have adopted the scheme voluntarily since 2006, though adherence to the Protocol is now regularly a formal condition of consent for new marine licences and licence renewals.

In 2009, The Crown Estate joined BMAPA to co-fund the Protocol Implementation Service, currently operated by Wessex Archaeology. When a find is encountered, it is reported through a Site Champion on the wharf or vessel to a Nominated Contact from the company owning the wharf or vessel who then alerts the Implementation Service.

The Protocol has been overwhelmingly successful, with over **2350** finds reported since its inception.

**This year, we're celebrating the 18th anniversary of the Protocol Implementation Service and this annual report covers the period from 1 October 2022 to 30 September 2023.**

## Access

Planning conditions relating to archaeology are placed on developments and dredging areas, which include a duty to publicise the results of archaeological investigations to the relevant bodies.

Once a find is reported to the Protocol Implementation Service, it is researched and compiled into a report. Details of the dredged finds are then disseminated to:

- the Site Champion who reported it;
- the Nominated Contact;
- Historic England;
- BMAPA;
- The Crown Estate;
- the National Marine Heritage Record (NMHR), maintained by Historic England; and
- the appropriate local Historic Environment Record (HER).

If considered wreck material, finds are also reported to the Receiver of Wreck in compliance with the *Merchant Shipping Act 1995* and they receive a unique report number, commonly known as a droit. All aircraft material is also reported to the Receiver of Wreck along with the Ministry of Defence as it may relate to the *Protection of Military Remains Act 1986*.

All finds are reported to Historic England's National Marine Heritage Record, and will soon be accessible via an online portal, such as the ones for terrestrial finds<sup>1</sup>.

Finds can also be explored through the Protocol StoryMap<sup>2</sup> which includes information about the Protocol, the Awareness Programme, dredged discoveries from Area 240 and the wider Palaeo-Yare landscape, and Operational Sampling where tonnes of aggregate brought back to wharves are assessed by archaeologists for artefacts.

All finds, old and new, are also published on the Marine Aggregate Industry Archaeological Protocol Facebook page<sup>3</sup> that was set up in March 2017.

Each annual report also publishes all the individual reports for finds that were made during that reporting year (see the back pages of this report), and previous annual reports are all available to download<sup>4</sup>.

In addition, the discoveries and achievements of the staff involved with the Protocol are acknowledged through various publications produced by Wessex Archaeology, including the biannual *Dredged Up* newsletter, also available to download via the previous link.

1. [www.heritagegateway.org.uk/gateway](http://www.heritagegateway.org.uk/gateway)  
2. [storymaps.arcgis.com/stories/2968f0b4062245ee815d04124bbd9368](https://storymaps.arcgis.com/stories/2968f0b4062245ee815d04124bbd9368)  
3. [www.facebook.com/marineaggregateindustryarchaeologicalprotocol/?ref=aymt\\_homepage\\_panel](https://www.facebook.com/marineaggregateindustryarchaeologicalprotocol/?ref=aymt_homepage_panel)  
4. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)



Above: a selection of finds reported to the protocol over the past year (for more details, see the back pages of this report)

## Raising awareness

The Protocol Awareness Programme is funded by BMAPA and The Crown Estate and implemented by Wessex Archaeology. Members of the Protocol Implementation Team promote awareness of the Protocol and keep awareness materials up to date, as well as visiting several wharves a year to maintain a close relationship with the staff. Emails between the Implementation Team, Nominated Contacts, wharf managers and Site Champions are encouraged throughout the year to keep a consistent flow of communication. Through emails, phone calls and during the visits, questions can be answered and feedback is gathered so that we can further improve the delivery and content of the Protocol.

### The Protocol Awareness Programme:

- delivers in-person training by an archaeologist during awareness visits to wharves, aiding industry staff to identify several different types of archaeological materials through interactive presentation slides as well as understanding the process of reporting and conserving finds of archaeological interest discovered. The training sets out guidelines on what to do if a find is suspected to contain asbestos or if invasive marine species are encountered. The training also demonstrates the different types of finds that can be encountered, dating from prehistory through to the modern period, by providing a collection of finds that have been previously reported for the wharf staff to handle;
- produces the biannual *Dredged Up* newsletter which aims to publicise the Protocol and highlight recent finds and news. The newsletter is sent out to each Nominated Contact, wharf and vessel that implements the Protocol. The most recent issue, Issue 33, printed in Autumn 2023 and all previous *Dredged Up* newsletters can be found online<sup>5</sup>;
- raises Protocol awareness amongst third parties, such as geotechnical and environmental survey companies working on behalf of the marine aggregate industry; and
- is available to support and train individual Site Champions to ensure that new and existing staff are familiar with the Protocol, either in person, over the telephone or via email.

5. [www.wessexarch.co.uk/projects/marine/bmapa/dredged-up](http://www.wessexarch.co.uk/projects/marine/bmapa/dredged-up)



Awareness visit to Murphy's Wharf



**Amy Lammiman (Wessex Archaeology) conducts training for members of the Brett team at Flathouse Quay, a new site in Portsmouth**

## Visits to wharves

Since the 2021–2022 annual report was published, there have been five Protocol Awareness Visits. Contact has also been maintained through emails.

The training sessions last around 30 minutes to minimise disruption to the work of the wharf and are often split into two or three sessions so that the wharf can continue working with a rotation of staff. Each session is designed to be informal and involves an interactive presentation to explain the different ways archaeology can reach the seabed and what to do if it is found in the cargo landed at the wharf.

The reporting process is also discussed (see **Page 5**).

A member of the Implementation Team brings an array of archaeological finds previously reported through the Protocol that wharf staff can handle and discuss. The training also sets out guidelines on what to do if a find is suspected to contain asbestos or if marine invasive non-native species are encountered. A member of the Implementation Team also brings handouts, laminated scale sheets and branded photo scale cards. Questions can be asked at any time during the training and an informal discussion is usually had at the end of the presentation. The handouts, photo scale cards and scale sheets are designed to be left at the wharf to enable the Site Champions to induct future new employees and so that current employees can refresh their memories.

Training certificates are sent out to the Site Champions to give to all wharf staff who receive the awareness training so

that they may add them to their working portfolios. These are emailed to each Site Champion or wharf manager after a wharf has been visited. Additionally, a feedback form is also given to the attending wharf staff at the end of each visit (or emailed) to gather comments and suggestions so that we can continue to make improvements to Protocol Awareness and the way we deliver the training.

Contact is maintained through regular emails, the Facebook page, the annual report and the *Dredged Up* newsletter.

All archaeological awareness materials can be accessed through the Protocol pages on Wessex Archaeology's website<sup>6</sup> and are available in English, Dutch and French.

The Protocol Implementation Team firmly believe that these visits are key to the success of the scheme as it promotes enthusiasm, increases knowledge and resolves issues. As well as delivering the training, the visits allow Wessex Archaeology to maintain contact with wharves and vessels; keep the content fresh; boost interest in the Protocol and promote it to both new and existing staff.

If you would like to arrange a Protocol Awareness Visit or would like to receive more advice on finds and finds reporting, please contact Wessex Archaeology via [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk).

6. <http://www.wessexarch.co.uk/projects/marine/bmapa/docs.html>

## Reporting process

Archaeological finds identified by wharf and vessel staff are reported through a Site Champion to the designated Nominated Contact of the company owning the wharf or vessel.

The process is designed so that the Nominated Contact uploads the images and information about the discovery, using the preliminary form, to the secure online console<sup>7</sup>. The console alerts the Protocol Implementation Service operated by Wessex Archaeology and the find is added to the database.

In some instances a Site Champion may prefer to report the material directly to the Protocol Implementation Team rather than going through the Nominated contact. In any case the Nominated Contact should be informed and will be included on any further correspondence between the Protocol Implementation Team and the finder.

If the find is classed as wreck material, it will need to be reported to the Receiver of Wreck under the *Merchant Shipping Act 1995* by the Nominated Contact. Although reporting the material was previously undertaken by the Protocol Implementation Service, the Receiver of Wreck has recently streamlined their process, and any finds should now be reported directly by the Nominated Contact to the Receiver of Wreck via their online form<sup>8</sup>. The Nominated Contact should then provide the Protocol Implementation Service with the RoW number, to ensure that finds can be identified using either unique ID in the future.

The Protocol Implementation Team investigates the find, and may send photographs and information to external specialists for additional interpretation, and then compile a report. Most of the reports are confined to an A4 page and will have an image of the object taken with a scale for reference.

The Protocol Implementation Team then communicates directly with the Nominated Contact and/or Site Champion regarding the archaeological importance of the discovery, its conservation and any storage recommendations.

The Nominated Contacts for each company during the 2022-2023 reporting year are detailed below.



Above: Wessex Archaeology staff with the mammoth tooth found by Darryl Mason aboard the Hanson Dredger Arco Avon, which was reported to the Protocol in November 2019 and is now on display in the Natural History Museum

BMAPA company	Nominated Contact	Position
Britannia Aggregates Ltd	Richard Fifield	Marine Resources Manager
CEMEX UK Marine Ltd	Samantha Ringwood Joe Holcroft	GIS & Licence Co-ordinator Resource Manager
DEME Building Materials Ltd	Christophe Matton Tom Janssens	Marine Resources Manager General Manager
Hanson Aggregates Marine Ltd (now Heidelberg Materials)	Nigel Griffiths Amy Stewart Bryn Lockwood	Principal Resources Manager Marine Resource Geologist GIS and Resource Coordinator
Isle of Wight Aggregates	Edward Skinner	Marine Resources Coordinator
Kendall Bros Ltd	Paul Stevens	Managing Director
Tarmac Marine	Edward Skinner	Marine Resources Coordinator
Volker Dredging Ltd	Will Drake	General Manager

7. [net.wessexarch.co.uk/bmapa/login.aspx?ReturnUrl=%2fbmapa%2findex.aspx](https://net.wessexarch.co.uk/bmapa/login.aspx?ReturnUrl=%2fbmapa%2findex.aspx)

8. [www.gov.uk/report-wreck-material](https://www.gov.uk/report-wreck-material)

## Protocol update

In 2022–2023, the Protocol celebrated its 18th year! During this year, 47 individual finds were reported through the Protocol (from 38 reports) including mammoth bones, a torpedo depth gauge and a US submarine badge. These have been added to a database of over 2350 finds reported since the launch of the scheme in 2005.

Without the reporting process, finds from dredged aggregate would most likely never have entered the archaeological record. Dredgers allow us to access areas of the seabed otherwise physically unexplored. The reporting procedure laid out in the Protocol is designed to allow users to follow an effective process of documenting and reporting finds. The Protocol Implementation Team aim to identify and conduct research on the find before producing a short report and sharing the information with marine aggregate industry staff and the named authorities. In an instance when the team cannot identify the object, an in-house or external specialist will be contacted to ensure that the utmost is done to provide a background and relative age on the reported find.

Future visits to the wharves to give the archaeological awareness training will be arranged for 2024 and it is hoped that Historic England and the Receiver of Wreck will be able to come along on one of the visits.

The number of reports each year and the ongoing success of the Protocol confirms that it is as relevant now as it was in 2005. The support of the marine aggregate industry has once again been substantial, with the continued reporting of significant archaeological finds maintained at a high standard through the Protocol and the welcome received during wharf visits.

Marine aggregates are an essential component of the UK building materials supply chain, and the anticipated scale and speed of marine development is leading to increasing competition for seabed space and environmental capacity.

This year a digital StoryMap was released showcasing the prehistoric archaeology that has come to light through the almost 20 years of the Protocol. The interactive StoryMap highlights the Protocol Awareness Programme, finds from Licence Area 240 and the regions of the Palaeo-Yare, and Operational sampling. This is available online<sup>9</sup>.

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8. [storymaps.arcgis.com/stories/2968f0b4062245ee815d04124bbd9368](https://storymaps.arcgis.com/stories/2968f0b4062245ee815d04124bbd9368)  
9. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](https://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)

Through the implementation of the Protocol, the marine aggregate industry has demonstrated that this is a cost-effective mitigation option for protecting cultural heritage that is both fragile and finite. The Protocol Awareness Programme trains wharf and vessel staff to recognise and report finds of archaeological interest discovered within cargoes without the need of an archaeologist being present. Because of the success of the Protocol, the model has been adapted and implemented for use in several other industries, and Wessex Archaeology continues to run scheme-specific protocols for other commercial development projects based on the marine aggregate industry model.

Further information about the Protocol and the Protocol Implementation Service is available online<sup>9</sup>.

To contact the Protocol Implementation Service, email [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk) or phone **01722 326 867**.



*This anchor, Tarmac\_1056, was discovered in aggregate dredged from Licence Area 430 in the East Coast dredging region, approximately 25 km east of Southwold, Suffolk. Tom Imrie discovered it on board City of London.*

## Training for the Implementation Team

During this year, members of the Implementation Team undertook additional e-learning refresher training in asbestos awareness.



## Dredged Up newsletter

In 2022–2023, two issues of the biannual *Dredged Up* newsletter were produced: Issue 32 and Issue 33.

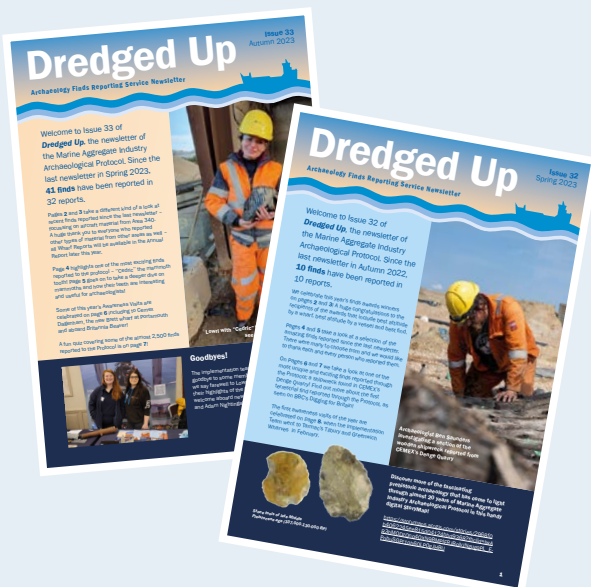
Issue 32 was released in April 2023 and outlined some of the year’s finds as well as publishing the winners of the annual Finds Awards. This issue introduced the first terrestrial find reported through the Protocol; a shipwreck found in CEMEX’s Denge Quarry. The first awareness visits of the year to Tarmac’s Tilbury and Greenwich wharves were also celebrated.

Issue 33 was distributed in November 2023 and featured the latest ‘Finds Round Up’. It also took a look at the excellent awareness visits to Cemex Dagenham, Brett Portsmouth and aboard *Britannia Beaver*. The story of ‘Cedric’ the mammoth tooth and its new home at the Natural History Museum, London was also presented, alongside a look at the importance of mammoth teeth. We also said goodbye to Lowri and Amy, members of the Protocol team, and welcomed Steph and Adam.

The newsletters are distributed to every wharf, all vessels and BMAPA member companies as well as The Crown Estate, Historic England, the Receiver of Wreck and a variety of other organisations, individuals and the general public during conferences and events.

A wider audience is reached with the digital copy of the newsletter that is posted on the Marine Aggregate Facebook page and Wessex Archaeology’s social media platforms including Facebook and LinkedIn. The digital edition is also downloadable from Wessex Archaeology’s website<sup>10</sup>.

The newsletters reach a wide audience to promote the operation of the Protocol and provide a positive showcase for the industry’s activities. They are also an important tool for raising and maintaining awareness and interest by publicising dredged finds and the dredging process.



10. [www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest](http://www.wessexarch.co.uk/our-work/marine-aggregate-industry-protocol-reporting-finds-archaeological-interest)



In Issue 33, we said goodbye to two members of the Protocol Implementation Team, Amy Lammiman and Lowri Roberts (top) and welcomed two new members, Stephanie Morris (middle) and Adam Nightingale (bottom)

## Finds Awards

The 2021–2022 Finds Awards were made to the following wharf and vessels, published in Issue 32 of *Dredged Up*. The Finds Awards for the 2022-2023 reporting year will be announced in the Spring *Dredged Up* (Issue 34).

### Best Attitude by a Vessel

Thank you to each vessel that has reported finds through the Protocol over the past reporting year. We congratulate Hanson’s **Arco Avon** for winning the award for 2021–2022, after they reported six finds within three reports: **Hanson\_1026**, a collection of three objects including the baseplate of a naval shell, an animal bone and an unidentified object, **Hanson\_1035**, a large intact cannonball and **Hanson\_1036**, two objects including the ball end of a bar shot and a conical object. Congratulations to finders M. Morley and Lance Allen!



**Above:** Hanson\_1036 (bottom) and Hanson\_1035 (top) together; **below:** the baseplate of a naval shell, one of a collection of three objects making up Hanson\_1026

### Best Attitude by a Wharf

In the 2021-2022 Finds Awards, we recognised the staff at **Clubbs Denton Wharf!** Since new manager Mark Wraight started, he and the rest of the wharf staff have had a great attitude with requesting a visit from the Implementation Team for awareness training. They have subsequently reported many great finds, including cannon fragments that were featured in the last edition of *Dredged Up* alongside aircraft components and a mill stone.



**Above:** Tony McKenna (Assistant Manager of Denton Wharf) holding Clubbs\_1030 and Clubbs\_1031; **below:** Brad with remains of cannon Clubbs\_1024

## Best Find

The best find of the 2021–2022 reporting year went to **Brett\_1019** (see image below). This find consists of three aircraft parts and 43 munitions all discovered within the same cargo dredged from Licence Area 340 in the South Coast dredging region, approximately 8.5 km south-east of the Isle of Wight. Paul Russell and Conrad Stuckey discovered the objects at Newhaven Wharf.

Wharf staff alerted the Implementation Team that they may have come across aircraft wreckage. In the initial report they highlighted that there is still paint remaining on one of the parts, potentially in a camouflage pattern. Images were sent to external specialist Steve Vizard who said that the larger piece is an engine valve that looks to be from a radial engine type, and the ammunition is .50 calibre, therefore initially pointing towards an American aircraft. Apart from the Mustang, which had an inline Merlin engine, most Second World War American aircraft used a radial engine and all American aircraft had .50 calibre Browning machine guns. He said that previous experience would lead him to believe that it's more likely to be a bomber than a fighter, which could mean that if it were outbound, there could well be heavy ordnance in the area. However, most ditched their ammunition on the way back. Steve confirmed with a colleague that the engine valve is from a Wright Cyclone.

This large radial engine was predominantly fitted to the American B-17 Flying Fortress and this is further confirmed by the aluminium strut section that appears to be a wing rib brace from a B-17.

The American Boeing B-17 Flying Fortress is a four-engine heavy bomber developed in the 1930s for the United States Army Air Corps (USAAC). It proved reliable and efficient enough to be used in almost every theatre of the Second World War. Legendary for its ability to sustain heavy damage in battle and bolstered by its nearly self-sufficient firepower, B-17s were most often used for daytime raids over Germany, as well as to wreak havoc on enemy shipping in the Pacific. Steve was also asked what the likelihood was of an entire aircraft wreck being on the seabed in this area. He said that it would be presumed that these parts wouldn't be too far away from the wreck site, however, depending on the amount of fishing and trawling that has taken place over the last 75 years, the parts could be distributed over a large area. Staff at the wharf have been asked to be vigilant for any other aircraft material dredged from this licence area.

More details about this find can be seen in the 2021–2022 Annual Report where it featured in Case Study 2 alongside **Brett\_1032**.



## Reports: Protocol

During the 18th year of operation, Wessex Archaeology received 38 reports through the Protocol Implementation Service. These reports encompassed details of 47 separate finds. Further details of each discovery are shown below and included in the wharf reports appended to this report.

### Finds reported in 2022–2023

Report ID	Description	Licence Area	Region	Wharf/ Vessel	No.
Tarmac_1049	Aircraft fragment	430	East Coast	Vessel	1
Hanson_1050	Cannonball	401/2	East Coast	Wharf	1
Hanson_1052	Engine component	401/2 or 461	East Coast	Wharf	1
Hanson_1053	Metal disc	461	East English Channel	Vessel	1
Brett_1054	Torpedo depth gauge	351	South Coast	Wharf	1
Tarmac_1055	Distal end of cow femur	430 or 460	East Coast or East English Channel	Wharf	1
Tarmac_1056	Anchor	430	East Coast	Vessel	1
Tarmac_1057	Possible hag stone	351	South Coast	Wharf	1
Hanson_1059	Lid of a trinket or cosmetics box	Possibly 401/2	East Coast	Wharf	1
Tarmac_1060	Fossil	460	East English Channel	Wharf	1
Tarmac_1061	Stone	509/3	Thames Estuary	Wharf	1
CEMEX_1062	Ejector seat part	137	South Coast	Wharf	1
Brett_1063	Cannonball	340	South Coast	Wharf	1
Brett_1064	Cone	340	South Coast	Wharf	1
Brett_1065	Cannonball	351	South Coast	Wharf	1
Brett_1066	Metal bracket	340	South Coast	Wharf	1
Brett_1067	Various metal parts	340	South Coast	Wharf	8
Tarmac_1068	Metal object	Unknown	Unknown	Wharf	1
Tarmac_1070	Metal flower	Unknown	Unknown	Wharf	1
Britannia_1071	Brass key	340	South Coast	Vessel	1
Britannia_1072	Plane part	340	South Coast	Vessel	1
Britannia_1073	Gas cylinder	340	South Coast	Vessel	1
Britannia_1074	Bomb shackle	340	South Coast	Vessel	1
Hanson_1075	Anchor head	401/2	East Coast	Vessel	1
Britannia_1076	Aircraft fragment	340	South Coast	Wharf	1
Brett_1077	Cannonball	340	South Coast	Wharf	1
Hanson_1078	Animal bones, probably mammoth	Unknown	Unknown	Wharf	2
Hanson_1079	Metal cap	Unknown	Unknown	Wharf	1
Brett_1080	Aircraft part	340	South Coast	Wharf	1
Tarmac_1081	Bone	351	South Coast	Wharf	1
Hanson_1082	Cannonball	473	South Coast	Vessel	1
Brett_1083	Metal gear/bracket	340	South Coast	Wharf	1
Tarmac_1084	US Submarine Badge	127/1	South Coast	Wharf	1
CEMEX_1085	Broken off metal part, marking with 'ZM24'	512	East Coast	Wharf	1
Cemex_1086	Possible piece of ship timber with treenail	513/1	East Coast	Wharf	2
Hanson_1088	Tile	401/2A	East Coast	Wharf	1
Hanson_1089	Nail	401/2A	East Coast	Wharf	1
Hanson_1090	Bone	401/2A	East Coast	Wharf	1

## Specialists

Members of the Protocol Implementation Team do their best to identify and research each and every find, but sometimes additional help is needed, and both in-house experts at Wessex Archaeology and external specialists, companies and organisations are consulted. It's a great way to find out more information about objects, with regards to their identification, age and possible source. Since the implementation of the Protocol in 2005, the number of willing and valuable experts we consult has grown to include a range of fields.

The table below provides a list of the specialists who gave advice during the 2022–2023 reporting year. Specialists that we have contacted in the past but not during this operational year are still included in Wessex Archaeology's internal lists but have been omitted from the table below. We are extremely grateful to all the specialists who have assisted in the identification of Protocol finds over the last 18 years.

Expert	Advice given concerning	Institution/organisation/role
Euan McNeill	Maritime artefacts	Wessex Archaeology
Alistair Byford-Bates	Maritime artefacts	Wessex Archaeology
Graham Scott	Maritime artefacts	Wessex Archaeology
Paolo Croce	Maritime artefacts	Wessex Archaeology
Lorrain Higbee	Zooarchaeology	Wessex Archaeology
Lorraine Mephram	Pottery, vessels and cutlery	Wessex Archaeology
Phil Andrews	Technical specialist	Wessex Archaeology
Charles Trollope	Cannonballs	Historical Ordnance Expert
Anthony Mansfield	Mechanics and engineering	Senior Naval Engineer
Trevor Parker	Ordnance	Ordnance Society
Mark Khan	Ordnance	Fellows International
Steve Vizard	Aircraft	Airframe Assemblies
Robert Cressman	Submarine artefacts	Underwater Archaeology Branch of the Naval History and Heritage Command of the US Navy



Specialist Paolo Croce (Wessex Archaeology) recording the timbers of the Dungeness Wreck using an Artec 3D scanner

## Case Study 1: Dungeness Wreck

In April 2022, during dredging operations at CEMEX's Denge Quarry near Lydd-on-Sea, on the Romney Marshes in Kent, a number of substantial ship's timbers were recovered by the backhoe dredger that operates at the quarry. This was reported to the Protocol as **Cemex\_1029** and featured within the Annual report 2021–2022, however, more information about the wreck is now available to report.

The wreck included at least four large sections of hull which were recovered alongside other timbers from approximately 4–6 m below the water level of the quarry. An archaeological exclusion zone was put in place around the location of the finds by the quarry staff, whilst Site Manager Michael Hinson reported the wreck to the Marine Aggregate Industry Protocol. This is the first time that a find had been reported from a terrestrial quarry and the discovery really highlighted the robustness of the Protocol.

Following the report, Senior Marine Archaeologist Alistair Byford-Bates travelled to the quarry to carry out preliminary recording to understand whether the remains were of archaeological significance. He recorded five structural elements comprising four sections of frames and planking, and one large section of hull with both inner and outer planking. In addition to these there was a mix of loose frames and planks. These were numbered and then measured, and multiple photographs were taken to aid further analysis and inform the next stage of the process. What was clear from the outset was that it was a well-constructed and well-preserved open water sailing vessel, with potentially enough material surviving to calculate its



scantlings (a ship's dimensions), build method, and date. This last one was helped by what appeared to be a number of frames with sapwood, and even bark present, all factors to aid dendrochronology dating of the wood.

Following Alistair's initial assessment, it was immediately identified that the wreck could be significant, and due to this and the potential threat of rapid degradation once the timbers were recovered, it was agreed with Kent County Council and Historic England to proceed with a phase of emergency recording. A team of archaeologists went to record the clearly significant remains in more detail.





The large sections of ship's hull were recorded using photogrammetry. Then, the over 140 individual timbers were marked with unique identifiers on tags. Once all the timbers were marked, they were removed layer-by-layer to record the entirety of the structure. Deconstructing the timbers in this way allows the team to appreciate how the vessel was built and observe hidden details, such as wooden plates found in between some frames, as well as the individual adze marks.

Once disconnected, the timbers were then carefully cleaned and recorded using traditional tape measurements, detailed photography and recording forms. Then they were scanned using an Artec 3D scanner producing a digital image of each timber.

Nautical specialists can interpret each individual timber using the 3D scans obtained during the recording phase. Using this method allows them to capture the complex geometries of the timbers and diagnostic features such as fasteners and toolmarks, which can be traced directly onto the timber's digital model.

Senior Marine Archaeologist and shipwreck specialist Paolo Croce noted that the wreck had characteristics of the so-called 'Iberian' shipbuilding tradition. These techniques were very time-consuming so he concluded that the wreck was unlikely to be modern but could date from the 16th to 18th centuries. Paolo noted that we are potentially dealing with a well-used vessel, with timbers on its keel that cover a period of at least 20 years. To date the vessel, Historic England funded dendrochronological assessment of the timbers recovered during the initial assessment. Fifteen cross-sectional slices were taken for preliminary dendrochronological analysis to be carried out by external specialists. The samples all had between 44 and 180 growth rings, which meant they were suitable for dendrochronological assessment. The tree ring matches showed that they could have been felled in the mid-late 16th century. One of the samples retained some sapwood and heartwood, which meant that a more precise felling date could be produced of AD 1558. This could make the ship contemporary with the Spanish Armada, one of the most

iconic naval engagements of the Elizabethan era. Twenty of the timbers appear to be contemporary and have an estimated felling date in the range AD 1534-47. A further five timbers are broadly contemporary and one of these has a precise felling date of spring AD 1561. The majority of the timbers seem to originate in East Anglia and Southeast England, though there is the possibility some of the later timbers came from further west. Many of the samples provided tree ring matches across several of the planks and framing timbers, and indicated that these were made of local Kent oak.

These dendrochronological assessments confirmed that this is an extremely rare discovery of a 16th century shipwreck. There are approximately only 500 16th to 17th century recorded wrecks around the coast of Kent and Sussex and less than 1% of these reported losses have been discovered on the seabed. Therefore, this pre-AD 1700 vessel is of national importance.

Once the phase of recording was complete, and following discussions with Kent County Council and Historic England regarding future storage of the timbers, it was agreed that they should be returned to a secure location within the quarry lake. Doing so has the advantage of ensuring that the ship assemblage remains together and available for study in the future. The material was covered by sand that had been excavated from the quarry, thus returning the timbers to their original environment and ensuring that the timbers remain in a suitable, permanently waterlogged environment for continued preservation.

One of the biggest mysteries regarding this wreck is how it got to its current location, as the quarry is 300 m from the sea. The location of the shipwreck suggested it was possibly linked to the shipyards and harbour at Small Hythe and the Cinque Ports. These were a confederation of ports, along the Kent and Sussex coast, dating back to at least the eleventh century, with their origin potentially in the Saxon period.

Experts believe the quarry site would have once been on the coastline, and that the ship either wrecked on the shingle headland or was discarded at the end of its useful life and subsequently became buried by the accumulated sands and gravels. The absence of any additional artefacts within the bilge (base of the ship) or concreted to the hull, seems to point towards an abandonment of the wreck, possibly as hulk, or the salvaging of material following the wrecking of the vessel on an easily accessible section of coast. The fact that it was found below the storm beach gravel illustrates just how much the Dungeness landscape has changed since the wreck was buried and in itself presents an interesting avenue for further research.

The story of the recovery, recording and dendrochronological analysis of the ship was featured on Episode One, Series Ten of *Digging for Britain* on BBC2, which aired on 1 January 2023. It was also featured in *Dredged Up* Issue 32, and a series of blogs to celebrate the one-year anniversary of the discovery of the wreck were released by Wessex Archaeology in August 2023<sup>11</sup>.

A special thank you needs to go to the staff at Cemex's Denge Quarry. Despite being a busy quarry site, they did an excellent job of reporting this unique wreck, voluntarily putting an exclusion zone where the wreck was found in the lake and fashioning a bespoke tank to submerge the remains to prevent deterioration before the archaeologists arrived on site. They also provided support during the survey, and we would like to thank them for their hospitality.

Thank you also to Kent County Council for managing the project, Historic England for funding the project, and dendrochronologist Robert Howard and timber specialist Damian Goodburn for their involvement in this project. Post-excavation work continues on the wreck.

11. [www.wessexarch.co.uk/news/investigating-dungeness-shipwreck-discovery-wreck](http://www.wessexarch.co.uk/news/investigating-dungeness-shipwreck-discovery-wreck)



Andrea Hamel (Wessex Archaeology) appears on *Digging for Britain* to discuss the story of the wreck's recovery



## Case Study 2: Submarine and Warship Badges

One of the most intriguing finds reported this year was **Tarmac\_1084**, seen below. The find was immediately noted as looking like a ship's badge. Although it was clearly a fragment of a larger badge and quite aged, it was noted that it had a letter 'N' and what looked like a fox or wolf insignia. Although initially it was thought to be a ship badge nothing could be matched to an official Royal Navy warship badge or a Merchant Navy badge.

The Coastal & Marine team at Wessex Archaeology were consulted and Senior Marine Archaeologist and shipwreck specialist Paolo Croce managed to match the find to a picture of a 'Sub Ron 4' badge of the US Navy's Submarine Squadron 4. This badge bears more than a passing resemblance to the badge fragment found and the team therefore think this find could be part of this squadron's badge. However, there is a mystery about how it got there. The team have searched hydrographic records and can find no reference to the loss of a US submarine or submarine tender in the area concerned. We know that Submarine Squadron 4 transferred to Key West from the Pacific in August 1945 and became part of the US Atlantic Fleet, now based in Connecticut. We suspect that squadron boats must have visited Portsmouth or the submarine base at Gosport at some point since 1945, possibly repeatedly. However, we have not traced any record of it having suffered a loss in the area.

The team decided to convene with the Underwater Archaeology Branch of the Naval History and Heritage Command of the US Navy to shed some light on this find. The pictures of the find were forwarded to Robert Cressman, resident submarine expert and responsible for the *Dictionary of American Naval Fighting Ships*, as well as such books as the *Official Chronology of the U.S. Navy in World War II*. While he concurred with the assessment regarding the insignia semblance, he regrettably was unable to identify further information regarding the unit or how the piece came to rest where it did. The US Navy also reviewed their mapping database for any potential losses in the area that could have some relation to it, but unfortunately nothing seemed pertinent. Amongst a series of Liberty ships and other vessels, the only submarine in the general vicinity was S-24/HMS P.555 off the Isle of Portland.

This find retains some mystery and has been an intriguing journey for the Protocol team. This is not the first instance where a Naval badge has caused some mystery, as was the case in the two *Cavendish* badges reported in 2008.

In November of that year, Cemex's Dover wharf reported the discovery of a ship's badge marked 'Cavendish'. There have been several ships by the name of *Cavendish* but this badge relates to a destroyer built in 1944 for the Royal Navy.



*Tarmac\_1084*, a find that retains some mystery: the letter 'N' and fox or wolf insignia included on this badge bear more than a passing resemblance to the badge of the US Navy's Submarine Squadron N

The *Cavendish* had a productive life after the Second World War until it was eventually retired. It arrived under tow in Blyth in Northumberland on 7 August 1967, where it was to be scrapped.

When **Cemex\_0195** (see image top right) was discovered, images were sent to Jenny Wraight from the Royal College of Arms in Portsmouth, who confirmed that the badge belonged to the destroyer. The badge was designed in 1945, at which time there was an embargo on producing ships' badges apart from a single screen badge, which was reduced to 12" in size. On this basis, it was initially believed that this example, which measures approximately 12", was the *Cavendish's* wartime badge. However, our interpretation of this find, thought to be the only badge that would have been created for this wartime destroyer, altered after the discovery of a second, identical badge by Brett's Cliffe Wharf, Kent (**Brett\_0228**, see image bottom left) in 2009. The second badge bears the same name and design and is the same size as the Cemex badge.

Following the discovery of the second *Cavendish* badge, Wessex Archaeology contacted Jenny Wraight again and she suggested that one of the badges may be a copy. Such copies were made for presentation, either to high-ranking officials who served on the vessels, or to towns who 'adopted' ships during Warship Week. Warship Week took place in 1942, before the *Cavendish* was built. During this time towns, cities and villages across the country were encouraged to raise money to 'adopt' a ship. Each town was given a financial target that they endeavoured to meet. The *Cavendish* was adopted by Kendal, in Cumbria, after the sinking of Kendal's previously adopted ship in 1943. Wessex Archaeology contacted Kendal Museum and the Town Clerk but neither had any recollection of owning a badge or of a badge in their collections.

Heather Johnson, Library Assistant at the Royal Naval Museum had a different hypothesis. She suggested that one of the badges was produced for the *Cavendish* in 1944, and that the second was commissioned for her refit in 1955. This, states Heather, may be likely as both badges show considerable wear, indicating that both were displayed externally and making the creation of a replacement for the refit more likely. Prior to the refit the ship is said to have sustained 'malicious damage'. This may also have led to the destruction, damaging or removal of the original badge.

A further theory, that these badges originated on the lifeboats of the *Cavendish*, was considered, but the Royal Naval Museum in Portsmouth informs us that lifeboat badges would normally have measured approximately 5", whereas the two dredged examples measure 12".

Both of the *Cavendish* badges and **Tarmac\_1084** have intrigued the Protocol Implementation Team and have provided interesting ways of accessing naval history.



Two identical *Cavendish* badges - above, **Cemex\_0195**; and below, **Brett\_0228**

## Case Study 3: The War in the Air: East of the Isle of Wight (Area 340)



*Britannia\_1074, a B7 bomb shackle, identified based on the reference marks [TYPE-B-7] [100-1100] and [FRONT]*

During the Second World War, Britain would face an invasion for which it was completely unprepared. It would change the country forever. This was the 'Friendly Invasion' where members of the United States Army Air Force (USAAF) founded the VIII Bomber Command (BC), the VIII Fighter Command (FC), and the VIII Ground Air Services Command (GASC) together making the Eighth Air Force. This was an American unit stationed in East Anglia, which, at its height, would number 350,000 service personnel. These servicemen would carry out thousands of sorties over the East Coast of Britain, ranging as far north as Norway and deep into the heart of Nazi Germany. Thousands would lose their lives.

As part of the Marine Aggregate Industry Archaeological Protocol, we can see some of the evidence of their battle for the skies of Europe. In Area 340, east of the Isle of Wight, there have been multiple examples of finds that help to paint this picture of fighting in the clouds. Here we will examine some of the objects recovered that help give us a glimpse into that conflict and link them to the impressive machines that would fight in them.

### American Airpower

#### Britannia\_1074

This find (seen above) was discovered by Dean Jackson and Robert Lockley. The inscriptions helped identify the find as a B7 bomb shackle. These shackles were what enabled American strategic bomber aircraft to safely store their munitions in flight before electronically releasing them over their desired target. Needless to say, these pieces of equipment were vital to a bomber force being able to carry out their mission. These shackles were used on three American aircraft: the B-17 'Flying Fortress', the B-24 'Liberator', and B-25 'Mitchell'.

The 'Flying Fortress' is the most well-known American bomber from the Second World War. B-17s were bristling with 11 .50 calibre machine guns. It was believed the aircraft could fight its way into German airspace, even without fighter support. The lack of fighter support was necessary due to the lack of a long-range escort fighter. Neither the British Spitfire nor the American P-47 had the range to accompany the bombers to their targets and back to bases in the UK. The RAF had worked around this issue by carrying out nighttime raids. Without airborne radar, German fighter aircraft could

only locate British bombers by chance. While safer, bombing at night was extremely inaccurate, with precision strikes against specific strategic targets impossible. Joined by B-24s with their 10 .50 BMG defensive guns, the decision was made to execute daylight raids into Germany and challenge the Luftwaffe for control of the skies.

It was a degree of overconfident optimism that the Luftwaffe would soon shatter. The strategy of daytime raiding would lead to events like 'Black Week'. During a series of raids, operating from bases across East Anglia, the Eighth Air Force took horrendous losses. In one raid, the 100th Bomb Group lost all but one of their 13 B-17s. In all, the Eighth Air Force would lose 148 of their aircraft, with over 1,500 airmen lost. Several aircraft would crash on their return. In one instance, the German Luftwaffe was able to follow groups of B-24 bombers back into their airbases in East Anglia. Attacking the aircraft during their vulnerable landing manoeuvres, resulting in ten aircraft being destroyed, and many more damaged and aircrew killed.

#### Britannia\_1073

With the chance of being shot down so high, it was important for bomber crews to be equipped in case of emergency. Discovered by Dean Jackson and Robert Lockley, Britannia\_1073 is a USAAF H1 oxygen cylinder, better known as a 'bailout bottle'. These would have contained around 124 bar of breathable gas that were carried by all USAAF aircrew. With the casualties that the Eighth Air Force were sustaining, they were desperately needed. In the event an aircraft suffered catastrophic damage, the crew's only means of escape would be to jump out of their likely burning aircraft.

While in ideal situations the pilot could lower the altitude of the plane to 15,000 feet, after taking damage enough to need to bail out, this was clearly not always possible. This could mean bailing out of your aircraft at 30,000 feet. This is the height of Mount Everest, with less than a third the oxygen at sea level and air temperatures of around -45 degrees. B-17 and B-24 aircraft were not pressurised, so crewmen would connect their breathing apparatus to ports in the airframe, which would provide air. On bailing, these would need to be disconnected and hooked up to the H1 bailout bottle. These would give around 10 minutes of breathing time. If this system failed, the advice given to aircrews was to 'take a deep breath' before disconnecting from the plane's air supply and jumping.



A, B and C, above: *Britannia\_1073*, a small gas cylinder with valve and gauge, discovered by Dean Jackson and Robert Lockley on board *Britannia Beaver*. The letters [..HOHEM..] and [..AND] are visible on the neck of the valve

The combination of freezing temperatures and a lack of oxygen could cause bailing crewmen to pass out during the jump. This could have disastrous consequences for crewmen who needed to manually activate and deploy their parachutes. The chances of being recovered if aircrew then landed in the sea were extremely slim. If an aircraft remained under control, it could be landed on the water, known as ditching. Here, the crew could deploy inflatable dinghies and could last a few days awaiting rescue. In the event of a bailout, the cold water meant that aircrew may only last minutes. A horrific choice for aircrew on-board damaged planes, to jump and face the cold water, or remain on a burning, crashing plane.

**Brett\_1019**

Paul Russel and Conrad Stuckey discovered these finds which, among other things, show how American aircrew were able to fight back against the Luftwaffe. Thirty .50 BMG rounds of ammunition and thirteen .50 BMG projectiles were recovered. During the Second World War, the M2 Browning Machine Gun was fitted onto almost all American aircraft. The .50 BMG round was notably more powerful than the .303 calibre machine guns that armed British aircraft and would remain in American service throughout the war. British fighter aircraft transitioned to cannon armament as the war progressed, and reliability issues pertaining to the Hispano 20 mm cannon were addressed. However, there was no way to equip these more effective weapons to bombers, with Bomber Command needing to wait till the end of the war and the introduction of the Avro Lincoln. It was this difference in perceived defensive capabilities between the British and American bombers that gave the USAAF the confidence to carry out its daytime raids. An M2 BMG fired a round more than three times heavier than the .303 Browning's used by the Lancasters and Wellingtons. A .50 BMG round was also capable of containing a small explosive, incendiary, or armour-piercing payload.



**Site staff must adhere to the munitions reporting guidance, and company H&S procedures when discovering and reporting items of potential ordnance.**

Right, *Brett\_1019*: D, an aircraft component which appears to be a wing rib brace from a B17; E, an aircraft component with paint still visible; and F, munitions discovered in the same cargo and therefore possibly relating to the same aircraft wreckage

### Cemex\_0999

It is important to note that the American aircrew of the Eighth Air Force were not alone in the battle for the skies of Europe. The RAF and USAAF would regularly take on missions together. The 20 mm cannon shell and five projectiles (seen below) recovered by Ricardo Plummer give us some evidence for that.



Above, a 20 mm cannon shell and five projectiles making up Cemex\_0999

As the Battle of Britain escalated, it quickly became apparent that even with eight machine guns mounted in the wings, the Hurricanes and Spitfires of the RAF were not capable of delivering enough damage to an enemy aircraft, particularly bombers, to bring down the enemy. It was decided to mount the Hispano-Suiza HS.404 20 mm cannon on a few Spitfires to trial. To fit the far larger weapon into the wing of a Spitfire, it needed to be placed on its sides. The weapons had never been designed to feed at this angle; the result was terrible reliability, with the weapons jamming after only one or two rounds.

The solution came with the now iconic 'blisters' in the Spitfire wings, which gave just enough room for the weapons to be installed upright. This meant that the Spitfire, armed with a pair of 20 mm Hispanos, could compete against the cannon-armed Focke Wulf Fw-190 and Messerschmitt Bf-109.

## The German Luftwaffe

### Brett\_1032

Found by Conrad Stuckey, the finds shown to the right are a series of engine components from a BMW 801 engine. This was a 14-cylinder radial aircraft engine and capable of producing up to 1,970 hp. They would be fitted to three Luftwaffe aircraft, the single seat Focke Wulf Fw-190 fighter and the twin engine bombers the Dornier Do-217 and Junkers JU-88.

The Fw-190 would only see sporadic deployment over Britain, primarily being deployed on the Eastern Front. However, when deployed against the USAAF and RAF it proved a superior aircraft, with a superior armament, faster speeds and turning circles than the American P-47 and Spitfire MkV. Only with the introduction of the Spitfire MkIX and Mustang P-51 did the Allies reclaim their edge. The four 20 mm cannons fitted into the aircrafts wings could make short work of enemy bombers when they were encountered.

The Do-217 was an improvement on the earlier Do-17 design and would eventually become a mainstay of the Luftwaffe's bomber fleet in the West. The Luftwaffe preferred the lighter twin-engine design over the heavier four-engine bombers, which the Allies preferred. This lighter and faster design made them less effective as strategic bombers but made them quicker and cheaper to produce.

The twin-engine multi-role aircraft, the JU-88, was the most produced German bomber design, with only the American B-24 Liberator being produced in greater quantities. A reason for this was the varied roles which the JU-88 could be deployed on. The JU-88 would function as a bomber, dive bomber, night fighter or heavy fighter. During the Battle of Britain, their higher speed than other bombers failed to compensate for reliability concerns, which led to a greater number of losses over comparable aircraft despite smaller numbers being deployed to the theatre.

The last combat on the British mainland engaging a foreign enemy combatant involved the downed crew of a JU-88A. Shot down in September 1940 in Kent, the four-man crew all survived the crash. Armed with the aircraft's machine guns and a submachine gun they attempted to destroy the sensitive equipment onboard the aircraft. When men from the London Irish Rifles arrived at the crash site, they opened fire on the Luftwaffe crew, wounding one and causing the others to surrender. The capture of the nearly intact aircraft was a significant intelligence boost for the British Forces. The incident was kept as secret as possible to hide the knowledge from the Germans that their equipment could be in British hands.

Further evidence for the sacrifices made during the defence of Britain and the fight against Nazism remains on the sea floor. Those working in licence areas with a high potential for discovery of material, such as Area 340, need to remain vigilant so we can make sure those sacrifices are remembered.

**Site staff must adhere to the munitions reporting guidance, and company H&S procedures when discovering and reporting items of potential ordnance.**



Above, three pieces of a series of components from a BMW 801 engine making up Brett\_1032, which was found by Conrad Stuckey

## Updates on past finds – Hanson\_0958: Animal Bone

In the *Annual Report to BMAPA 2019-2020*<sup>12</sup> we reported on **Hanson\_0958**, an animal bone that was thought to possibly exhibit evidence of marks from a stone tool.

There was a delay in getting the bone assessed by the Natural History Museum in London due to covid restrictions, however, in December 2022, the bone was assessed by Simon Parfitt, Lucile Cr  t   and Silvia Bello. The following provides a summary of their report.

The bone consists of the distal end and most of the shaft of the tibia of a horse. The size of the tibia is consistent with Middle-Late Pleistocene *Equus ferus*. The features of interest include a spiral fracture with chipped edges (a), linear incisions that cut across the distal end of the shaft (b), and an oval depression located on the anterior face of the distal end (c), which was not examined.

The areas of interest were imaged using an optical focus variation microscope (Alicona G5+ Infinite Focus System,

Alicona Imaging GmbH, Austria). The breakage features on **Hanson\_0958** were then compared with the taphonomic reference collection at the Natural History Museum, as well as fossil assemblages from Kents Cavern, Devon and Gough's Cave, Cheddar, Somerset, that demonstrate carnivore chewing and butchery of horse bones.

It was determined that the spiral break likely occurred soon after death, when the bone was fresh, and it is thought that the tibia was broken and flaked by a large mammalian carnivore, such as a spotted hyena. The linear incision is suggestive of the marks from trampling and sediment abrasion. Although this ruled out deliberate human action on the bone, the association with hyenas remains very exciting, as it supports the conclusions found on the scavenged rhino scapula **Hanson\_0937** discovered in 2019<sup>12</sup>, and continues to provide information about what the environment would have been like in the East Coast region in the past, as the spotted hyena became extinct approximately 31,000 years ago in Britain and north-west Europe.



12. [www.wessexarch.co.uk/sites/default/files/field\\_file/annual%20report%202019-2020.pdf](http://www.wessexarch.co.uk/sites/default/files/field_file/annual%20report%202019-2020.pdf)

## Liaison and accessibility

Details of each discovery have been sent to:

**Mark Russell** British Marine Aggregate Producers Association

**Stuart Churchley** Historic England, Marine Planning  
Archaeological Officer

**Neil Guiden** Historic England, Data and Analysis Manager

**Andrew Cameron** The Crown Estate

**Nick Everington** The Crown Estate

**Mark Wrigley** The Crown Estate

Details of discoveries regarded as wreck under the *Merchant Shipping Act 1995* have been forwarded to the Receiver of Wrecks, Graham Caldwell and Lydia Woolley, and Deputy Receiver of Wrecks Andrea Bailey and Callum Thomas. In 2022–2023 the following reports were deemed to represent items of wreck, and the table includes the droit numbers assigned by the Receiver of Wreck:

Report ID	Droit Number
Tarmac_1049	308/22
Hanson_1050	304/22
Hanson_1052	320/22
Hanson_1053	318/22
Brett_1054	007/23
Tarmac_1056	011/23
Hanson_1059	013/23
Cemex_1062	018/23
Brett_1063	019/23
Brett_1064	022/23
Brett_1065	023/23
Brett_1066	024/23
Brett_1067	025/23
Tarmac_1068	065/23
Tarmac_1070	066/23
Britannia_1071	026/23
Britannia_1072	027/23
Britannia_1073	028/23
Britannia_1074	029/23
Hanson_1075	021/23
Hanson_1082	036/23
Tarmac_1084	045/23
Cemex_1085	045/23
Cemex_1086	068/23
Hanson_1088	117/23
Hanson_1089	117/23

This year seven reports may have been related to aircraft (see appended Wharf Reports for more details):

- Brett\_1080
- Britannia\_1072
- Britannia\_1073
- Britannia\_1074
- Britannia\_1076
- Cemex\_1086
- Tarmac\_1049

Although the Protocol received a number of reports of artefacts which may relate to vessels considered to be wreck material, none of them were thought to directly relate to unknown and uncharted wreck sites. Consequently, no reports were forwarded to the United Kingdom Hydrographic Office (UKHO) in the 2022–2023 reporting year.

Information on each find has been forwarded to each county's HER (Historic Environment Record) relevant to the location of the archaeological discovery. In the case of a discovery where the original location is known, this will be the HER closest to the dredging licence area. Discoveries made at wharves where the licence area is unknown are reported to the HER nearest to the wharf.

Further details of liaison and the dissemination of data to interested parties are included in the wharf reports appended to this report.



Top, Brett\_1080; middle, Britannia\_1072; and bottom, Britannia\_1076

## Discussion

### Importance

Thirty-eight reports were raised during the 2022-2023 reporting year, and although less than the Protocol Implementation Service's expectation of around 50 reports a year, the reports comprised 47 individual finds.

The finds reported through the Protocol this year represent a diverse range of periods, emphasising that previous awareness training is successful in providing background information from all periods. The various archaeological material and the amount that is still reported reiterates the importance of the Protocol and demonstrates the wealth of archaeological material still on the seabed. Investigations into these finds expand our knowledge of the past and contribute to our understanding.

### Success

Reports were made this year from Hanson, Tarmac, Cemex, Clubbs Marine, Volker and DEME.



### Timely reporting

The Nominated Contact must notify the Receiver of Wreck of any wreck-related material within 28 days of it being removed from the seabed. Wreck-related finds include any structural elements or artefacts that have come from a ship or aircraft. The reporting time limit is a legal requirement of the *Merchant Shipping Act 1995* that exists regardless of the presence of the Protocol, and this is why the Protocol Implementation Team urges all finds to be reported as soon as they are found. Once the find has been reported to the Receiver of Wreck, the Nominated Contact should forward the droit number to the Protocol Implementation Team so that we can keep our records updated. The Protocol Implementation Team will then liaise with the Receiver of Wreck regarding further research undertaken and with the positional details of the find. Recently the reporting of finds has occurred soon after the items were discovered, which is fantastic!

### Key issues

The Protocol has not been rewritten since its inception in 2005 and has only had minor addendums appended to it relating to the handling of specific finds, which demonstrates the robustness and effectiveness of the scheme. During each year of Protocol implementation, minor operational situations are recognised, and the Protocol Implementation Service develops and adapts to overcome these. This year the following points have been raised for discussion:

#### Less use of the discoveries form

There has been a decrease in the number of finds reported directly through the console, with images being emailed to the Protocol Implementation Team instead. This manner of reporting is more than acceptable; however, a Discoveries Form is needed so that the Team can upload the find on to the console with as much detail as possible. Details such as finder, date found and originating licence area are all needed for this to be successful. If you do not have a copy of the discoveries form or have misplaced it, please email [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk) and we will be happy to send you a digital copy.

#### Images of finds

If possible, multiple images of a find should be taken to be included with reports as this can significantly aid the identification process. In particular images including scales of measurements, defining marks, stamps and the nose fuze and base of munitions can be very helpful (although this is not always possible especially with live munitions). Remember to follow company Health & Safety guidance and only take photos and measurements if safe to do so.

#### Regions with nil return

This year, there were no reports of finds among material dredged from the Thames Estuary, North West or South West regions. There have been no reports from the North West region since the 2017-2018 protocol year, and no reports from the South West region since the 2014-2015 protocol year.

Right: Amy Lammiman (Wessex Archaeology) at Cemex, Dagenham



## Artefact patterns and distribution

Through the use of a Geographical Information System (GIS; ArcMap 10.8), patterns and trends such as artefact discovery location and concentration can be studied. During the reporting process, the Site Champions or Nominated Contacts are asked to give the licence area number of the object, if known, as well as the dredging track-plot, in order to provide greater accuracy of the location of the discovery. This allows us to assess finds both within the licence area and on a regional basis, which is helpful when considering future licence applications within existing dredging regions. Patterns in artefact concentration can potentially identify sites of archaeological interest or debris fields or, alternatively, licence areas which are more likely to yield finds of archaeological interest in the future. When a large concentration is discovered from one area, it is useful to look back at previous years to compare what that particular licence area has yielded in the past.

Archaeological Exclusion Zones (AEZs) are also visible within the GIS map, which is useful when plotting finds of a contentious nature, to note the distance of discovery from a previous AEZ as tides are able to move lighter objects from within these zones. The GIS map is updated every time a new AEZ is implemented.

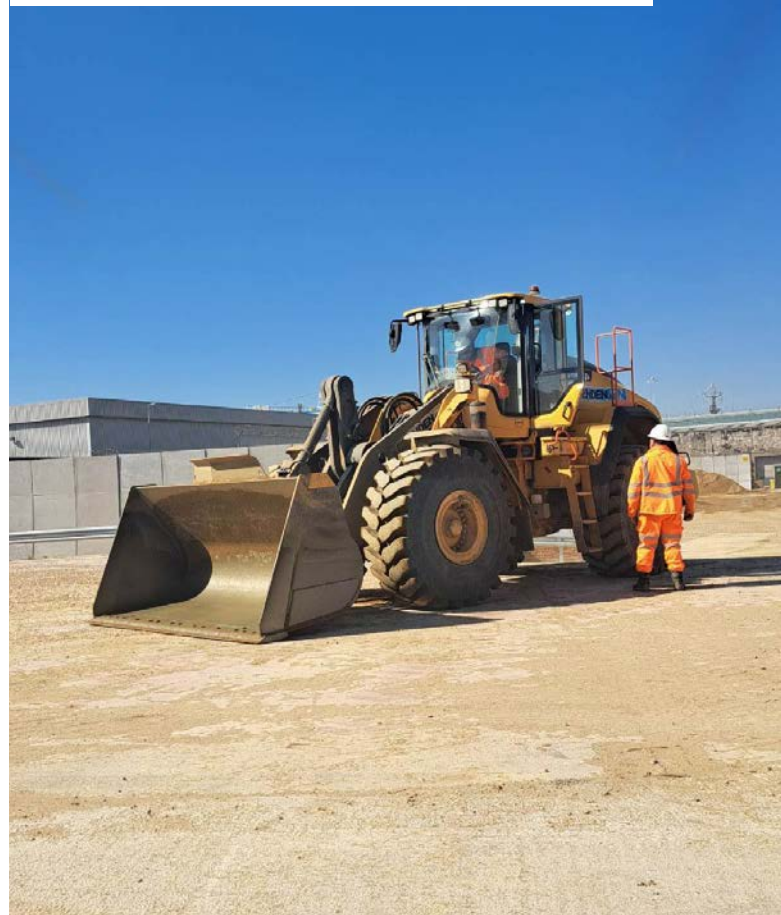
Archaeological material is not distributed evenly on the seabed. Some areas have a higher potential than others to contain material that entered the archaeological record either accidentally or deliberately. Some areas, such as the East Coast are known to have had Palaeolithic activity when sea levels were much lower than the present day. Other areas are known to be post-Second World War dumping grounds which have become apparent from artefact type and quantity in these areas. We also know which licence areas tend to yield more munitions and should be approached with caution.

The kind of dredger used to dredge the seabed may also play a role in the quantity of archaeological material recovered. Charter vessels are larger and have a greater dredging capability, therefore they usually dredge deeper into the seabed. This may result in more material being discovered in the cargo which is why information of the delivering vessel is requested.

The survival of artefacts will depend on the marine environment in which they lie. Most of the finds reported this year, as in previous years, are modern and made of metal which is not unusual as it tends to be more durable within a harsh underwater environment in comparison to organic finds. Finds such as bone and teeth from submerged prehistoric landscapes or wooden shipwrecks may be poorly preserved, unless they are buried beneath fine grained sediments, which may account for the low percentage of finds reported of these materials, although animal bones have been reported this year both independently and in conjunction with operational sampling.

For finds to be discovered, the high potential for loss or discard must coincide with a high potential for the preservation of archaeological materials.

Based on potential and survival, some licence areas will therefore contain more archaeological remains than others and may be associated with more specific time periods than others. Other factors, such as whether finds are discovered in isolation or grouped with similar items, also add to their context. In most cases, objects are reported as single isolated finds, but we do occasionally receive reports of multiple items found in the same location; this year aircraft material and munitions being prime examples. The significance of a find can therefore depend on its location as much as the nature of object in itself.



Left: Flathouse Quay, a new site for Brett in Portsmouth

## Distribution of artefacts by dredging region

There are seven dredging regions around the UK:

- Humber;
- East Coast;
- Thames Estuary;
- East English Channel;
- South Coast;
- South West; and
- North West.

In 2022–2023, 11 reports came from the East Coast with a further one possibly coming from this region or the East English Channel. Two reports came from the East English Channel, 19 from the South Coast, and one from the Thames Estuary.

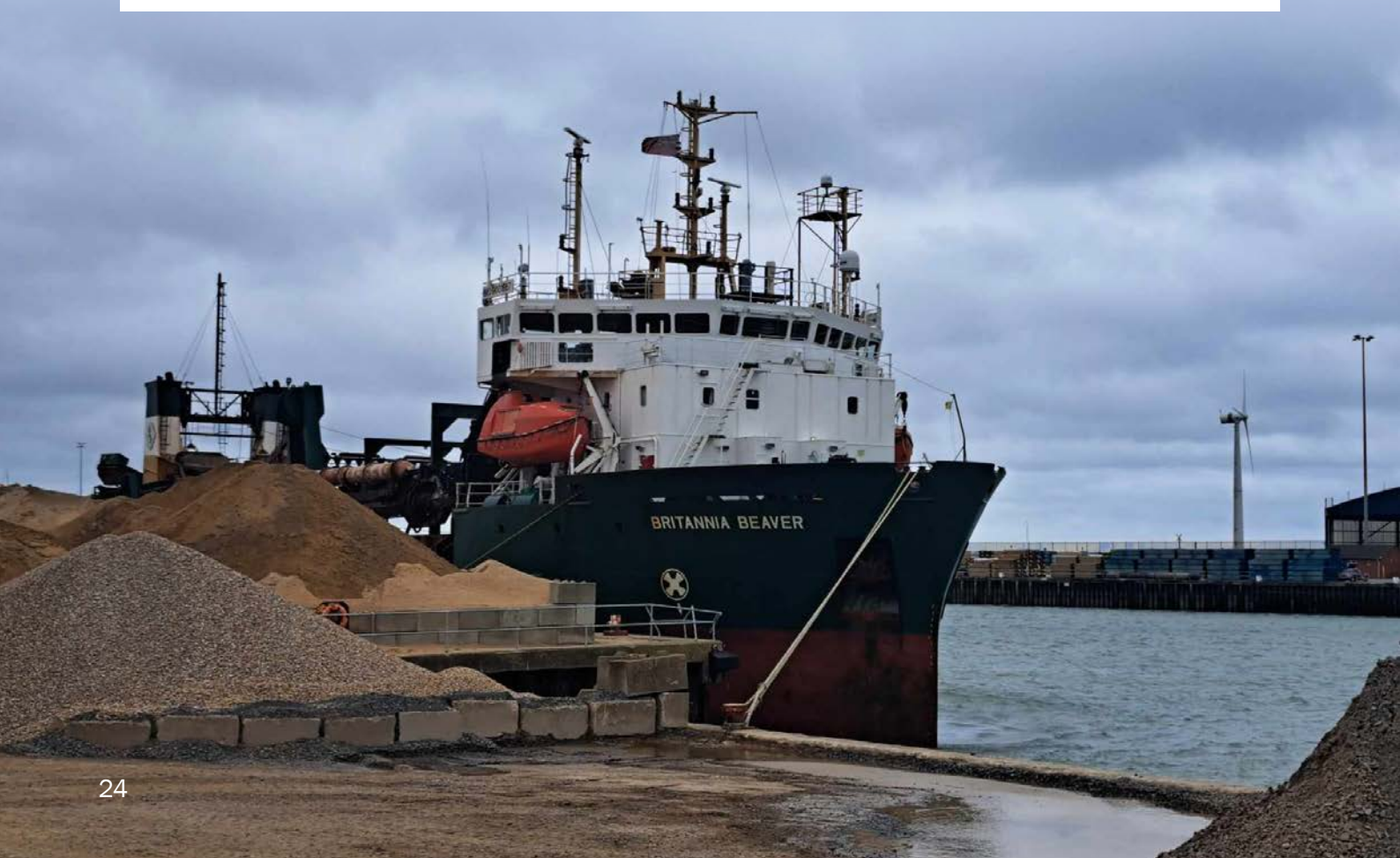
Four reports were from an unknown region as the finds were discovered on the magnet, crusher grid and material from a previous oversize stockpile.

No reports were received from cargoes dredged from the Humber, North West or South West regions.

**2021 data:** [www.thecrownestate.co.uk/media/4242/the-area-involved-24th-annual-report.pdf](http://www.thecrownestate.co.uk/media/4242/the-area-involved-24th-annual-report.pdf)

**2022 data:** [bmapa.org/documents/25th-Area-of-Seabed-Dredged-Report-2023.pdf](http://bmapa.org/documents/25th-Area-of-Seabed-Dredged-Report-2023.pdf)

Region	Millions of tonnes of construction aggregate dredged		Number of finds reported through the Protocol	
	2021	2022	2021-2022	2022-2023
Humber	3.5	3.69	2	0
East Coast	3.3	3.60	12	12
East Coast or East English Channel	-		0	1
Thames Estuary	1.6	1.69	0	1
East English Channel	4.48	4.54	6	2
South Coast	3.99	3.65	68	25
South West	1.43	1.30	0	0
North West	0.26	0.22	0	0
Unknown		-	13	4
Terrestrial location	-	-	1	0
Totals			102	47



## Distribution of artefacts by date and archaeological typology

### Prehistoric finds

During the 2022-2023 reporting year, only one find report was deemed to be Palaeolithic (between 900,000 and 9,000 years ago) in date. This was **Hanson\_1078**, (animal bones reported to Wessex Archaeology staff during Operational Sampling at Dagenham wharf).

### Maritime artefacts

Over half of the finds reported this year are believed to be maritime in nature, including multiple cannonballs, torpedo depth gauges and anchors.

None of the marine finds were thought to be related to a wreck site. All of the finds appear to be isolated discoveries, which could have been lost overboard, purposely dumped at sea, or have been moved along the seabed from wreck sites elsewhere.

### Ordnance and munitions

Several munitions, a range of cannonballs, were reported through the Protocol this year.

It is always advised that wharf staff should ensure that company Health & Safety policies are followed before any ordnance is reported through the Protocol.

### Aircraft

Several discoveries were made relating to aircraft this year, including those discussed in Case Study 3. All aircraft finds were reported to the Receiver of Wreck and the Ministry of Defence.

### Non-archaeological

One find, **Tarmac\_1060**, comprised an ammonite fossil and therefore is not technically counted as archaeological.





Image by Bradley Troubridge from Greenwich Wharf

## Conclusion

The Marine Aggregate Industry Archaeological Protocol continues to be a relevant mitigation programme for offshore aggregate works. It also continues to be a model from which other industries draw inspiration as a framework for reporting archaeological material. It remains a successful and applicable template for preserving heritage on the seabed, for gaining understanding about the unexpected discoveries and for reaching audiences within the aggregate industry to improve their knowledge and understanding of archaeology. This is reiterated by the reports received this year from wharf and vessel staff and the contact that has been maintained with Nominated Contacts and Site Champions.

The application of the Protocol ensures that archaeological information is preserved through recording and timely reporting and is disseminated as widely as possible, so that everyone can enjoy and explore our underwater cultural heritage. The fact that reports and images are uploaded to the website and on to social media platforms and that *Dredged Up* is handed out at engagement events has targeted a wider audience than just the aggregate industry. When work experience students visit the Coastal & Marine team, the work they do with us often revolves around the Protocol and the finds that have been reported. This past year, we were particularly fortunate to have Amy Lammiman working with the Protocol. She is a student at the University of Southampton and came to us on a one-year placement during her degree.

The enthusiasm and diligence of wharf and vessel staff ensures the success of the Protocol. Everyone's support has ensured that the Protocol has become embedded in commercial processes, which in turn reduces the impact of dredging on underwater cultural heritage by making the archaeological record available for future generations. At the end of each wharf visit there are always discussions between a member of the Protocol Implementation Team and wharf staff, during which questions are raised and discussed, and ideas gathered on how to make the Protocol more relatable or easier to use. It is because of such informal discussions that the mugs were developed - an idea that became a reality and were greatly received by all the staff.

The Protocol Implementation Service Team would like to thank everyone who has helped to support the Protocol during the 2022-2023 reporting year.

## The future

Protocol Implementation continues to be run by Wessex Archaeology and finds are reported regularly. If you have any questions about finds reporting and the Protocol, please contact us via [protocol@wessexarch.co.uk](mailto:protocol@wessexarch.co.uk).







## Tarmac\_1049: Aircraft Fragment

This aircraft fragment was discovered in Licence Area 430 in the East Coast dredging region, approximately 23 km east-south-east of Southwold. Lewis Bell, Mark Wakefield and Ben Macmillan discovered it on board *City of London*.

This large metal object was reported as a piece of aluminium covered in rivets/bolts and measures approximately 420 mm by 320 mm.

Photographs of the object were shown to Stephen Vizard, an external aircraft specialist. His response was that it appeared to be from an aircraft, possibly a web plate from a wing spar, or large wing rib. Initial thoughts were that it could be either British or American. After consultation with an American aircraft specialist, it was stated that it has the appearance of a piece of a United States Air Force (USAF) but it is impossible to say which. The visible numbers and markings present on the object (WP, EF3520 10, 00.0 01.02.37) don't give any clues, unfortunately.

As this item is related to an aircraft, it may be part of a site where an aircraft was ditched or lost. There are no records of an American aircraft crash site off the coast of Great Yarmouth, although there are records of several RAF crash sites (<https://www.baaa-acro.com/index.php/search-results?combine=great+yarmouth> accessed December 2022) as well as the site of a German Dornier Do217 approximately 12 km away ([https://blogs.wessexarch.co.uk/aircraftcrashsitesatsea/files/2008/03/aircraft\\_crash-sites\\_at\\_sea\\_report.pdf](https://blogs.wessexarch.co.uk/aircraftcrashsitesatsea/files/2008/03/aircraft_crash-sites_at_sea_report.pdf) accessed 2022).

Depending on the amount of fishing and trawling that has taken place over the last 75 years, there is the possibility of parts being dragged or dumped by fishing vessels, for instance fishermen may jettison such parts found in their nets in an area where they don't fish, to get rid of the parts, so that they won't be netted again. Therefore, this part could come from a site a distance away.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk.



## Hanson\_1050: Cannonball

This cannonball was discovered at Greenhithe Wharf by Stuart King, in an aggregate cargo dredged from Licence Area 401/2 by *Arco Dijk*.

Hanson\_1050 is a large cast iron cannonball with a diameter of 120 mm or 4.72 inches. No weight was given. It is eroded, with an uneven surface and a flat side on the left.

Images of the cannonball were sent to Charles Trollope, an expert in historical ordnance, who stated that it was not English but Dutch from the 17th century, from either the battles of Lowestoft 1665 or Solebay 1672. Specific characteristics, such as a flattened edge on the left side from when it would have been poured, as well as the change in colour and surface imply this. The size is a 27-pounder, opposed to the English 24-pounder. It is not uncommon to find cannonballs in the English Channel due to its commercial value and the many battles that were fought there between Britain and other European powers. The 17th century saw the beginning of the Golden Age for Holland and their rise to a European Superpower. With the growth of the Dutch naval and commercial fleets England was spurred to collude against them with the Spanish with aim to hurt and weaken Dutch trade in Europe and the East Indies as both competed to dominate shipping routes. The Battle of Lowestoft on the 13 June 1665 saw the Dutch suffering a huge naval defeat. England at this time was trying to take control of Dutch merchant shipping and colonies, so to avoid a second blockade by the English, the second Anglo-Dutch war ensued. England lost 1 ship and the Dutch 17. It is still considered as one of their greatest defeats. This battle set up England as a maritime superpower.

The battle of Solebay on 28 May 1672 prevented the beginning of a Anglo-French war against the Dutch naval fleet. The battle was a draw with both sides claiming victory. The underprepared English fleet lost 4 ships and the Dutch losing 2.

It is unknown whether this cannonball was used in battle or fallen off/on a sunken vessel, but its flattened side implies it might have been fired.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 304/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk





## Hanson\_1052: Engine Component

This engine component was discovered in Licence Area 401/2 in the East Coast dredging region or in Licence Area 461 in the East English Channel dredging region. Tom Shenton discovered it at Frindsbury Wharf.

This engine component was reported by wharf staff as a metal fragment. Although unsure of what it may be, the find was reported as quite heavy, and therefore unlikely to be aircraft due to its weight.

In order to be sure, photographs of the object were shown to Steve Vizard, an external aircraft specialist who said it appears to be an internal mechanism from an engine related generator, starter motor, or alternator type of device. It has clearly been underwater for a considerable amount of time as the outer casing is corroded, leaving only the inner workings. He stated that it could be from an aircraft engine (although he thinks this is unlikely) and could just as easily be from a marine vehicle, car or even motorbike.

As it is unclear what this object is, it is unknown how it entered the marine environment. It may have been thrown overboard due to being broken or alternatively, it belongs to a larger piece of engine or wreck on the seabed and has broken free.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 320/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Kent.



## Hanson\_1053: Metal Axle

This metal find was discovered in Licence Area 461 in the East English Channel dredging region, approximately 49 km south of Eastbourne. Steve Liptrot discovered it on board *Arco Avon*.

This find was reported by wharf staff as a metal disc with multiple holes, various levels and different materials. It has a diameter of approximately 140 mm and a height of 80 mm and has suffered from corrosion whilst underwater. Wharf staff noted that the find appeared to have rubber on top which allows it to turn forwards and backwards. They suggested it may be some sort of control system lever or flange.

Images of the object were sent to Anthony Mansfield, a senior naval engineer, who suggested that this is an automotive axle. An axle is a rod or shaft that rotates the wheels and supports the weight of your vehicle. Axles are essential components of any vehicle and come in three main types: front, rear, and stub. Essentially, the axles transfer power and torque from your engine to your wheels. Axles are an integral component of most practical wheeled vehicles. As this one is very rusted it suggests that it has been underwater for some time and may come from an older vehicle.

As this object is thought to be of automotive origin, it is unknown how it entered the marine environment. It may have been lost overboard or intentionally discarded when it came to the end of its useful working life. It is considered to represent an isolated find.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 318/22)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex



### Brett\_1054: Torpedo Depth Gauge

This torpedo depth gauge was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Matthew Reardon discovered it Cliffe Wharf.

This large metal find was described by wharf staff as being a brass and copper item, possibly a pressure or temperature gauge. They noted that the find is curved, possibly in order to be mounted on the inside curve of a cylinder with a rubber diaphragm on the mounting face. Wharf staff also recorded many small details present on the find including remnants of orange paint around the outer face and a series of stamps. The stamps include letters, numbers, and a MOD broad arrow mark.

Images of the find were sent to senior naval engineer Anthony Mansfield. He agreed with wharf staff that it is some sort of pressure sensing device, as the rubber diaphragm makes that reasonably clear. The curve on it seems to indicate that it is indeed mounted inside a cylindrical object. That diaphragm is designed for a reasonably low pressure as governed by its diameter. Combined with the clue offered by the broad arrow, Anthony suggested that this find was part of a depth control device for a torpedo.

With this information, images were then sent to ordnance specialists Mark Khan and Trevor Parker, respectively. They stated that the stamps on the find including the broad arrow indicate that this was indeed part of a torpedo. The stamps include '18" VIII' which implies that this was part of an 18" Mark VIII torpedo. These types of torpedoes were used on submarines during the First World War and dropped from aircraft between 1920 and 1937. They weighed 1736 kg and had an explosive charge of 145 kg TNT. Mark suggested that the '1035' stamp might be linked to the manufacture date as it's within the service date range of use.

Trevor contacted further specialists who concluded that the part appears to be the external hydrostatic piston and pendulum depth control cover of the torpedo. The black oval shape would be the diaphragm part that "flexes" and relays the external water pressure to the internal pendulum mechanism. The mechanism then controls the torpedo set depth and performed by mechanical linkage to the depth planes located on the tail section.

Other finds associated with torpedoes have been reported through the protocol:

LTM\_0540 is an internal component of a torpedo which includes the transverse gear mechanism which allowed rotational propulsion to be transferred to the propeller. This find was discovered in a mixed cargo at Greenwich Wharf.

Brett\_0253 is a name plate that was also discovered from Cliffe Wharf from mixed cargo. It was probably from a compartment on a ship which would have been associated with the torpedo equipment. The word 'Torpedo' is embossed onto the plate and the first letter of the next word appears to be a 'G'; two possible phrases which have been suggested including 'Torpedo Gear Store' and 'Torpedo Gyro'.

We cannot be sure exactly how this find entered the archaeological environment. The torpedo may have been fired as a training exercise or in conflict.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Receiver of Wreck (Droit 007/23)
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Tarmac\_1055: Cow Femur

This bone was discovered in either Licence Area 430 or 460 in either the East Coast or East English Channel dredging region, off the coasts of Southwold and Eastbourne respectively. Ian Massey discovered it at Tilbury Wharf.

This large bone is the first find reported to the protocol by Tarmac's Tilbury Wharf. It is approximately 200 mm in length and a width of 140mm. Staff noted that it was a clean cut straight through the shaft of the bone.

Images of the bone were sent to Wessex Archaeology's animal bone specialist, Lorrain Higbee. She identified the bone as the distal end of a right cattle femur that has been sawn through. The femur, or thigh bone, is the longest and strongest bone in your body. The distal end is the lower part of the bone which is identifiable by two large prominences (or condyles) on either side of this end of the bone that form the upper half of the knee joint, which is completed below by the tibia (the shin bone) and patella (the kneecap).

The size and characteristics of the bone allows for the species and potential time period to be identified. Lorrain stated that the overall large size of the bone suggests that it is relatively recent rather than a prehistoric specimen. The size and shape of cows that we know today are a result of selective breeding, especially during the so-called Agricultural Revolution of approximately 200 to 300 years ago. This cow would be likely to have been one of an 'improved' breed living at some point from the post medieval period to the modern period.

The clean cut is most likely a saw mark, however the characteristic lines have eroded away. Wessex Archaeology Geoarchaeologist Sander Aerts described the find as "classic butchering waste". This gives us a clue into how the bone ended may have entered the marine environment. Butchered animal parts as well as live animals were carried on vessels to be consumed on board with bones and waste products usually discarded overboard. Beef seems to have been the staple diet of many ships but was more often than not transported in preserved form, which has been found in many shipwrecks. This includes the Mary Rose, in which excavations of the wreck recovered eight casks containing over 2,000 butchered cattle bones.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## Tarmac\_1056: Anchor

This anchor was discovered in aggregate dredged from Licence Area 430 in the East Coast dredging region, approximately 25 km east of Southwold, Suffolk. Tom Imrie discovered it on board *City of London*.

This find was reported as a small metal anchor. It is in fairly complete condition and looks fairly modern. You can see the flukes and the ring, and it appears that it had a stock, as it has a hole below the ring. Measurements taken by the vessel show that although the shaft is slightly bent the anchor has an approximate length of approximately 1000 mm, and it is about 600 mm wide across the base.

Images of the anchor were sent to members of the Coastal & Marine team at Wessex Archaeology. Senior Marine Archaeologist Graham Scott stated that this find is a small, modern fisherman type of anchor with no obvious archaeological interest. Senior Maritime Archaeologist Alistair Byford-Bates agreed and stated that based on its size it was probably a small 19th or 20th century boat anchor lost by a local fisherman, as it is too small to hold anything substantial in size. Alistair also noted that it appears to have had a collapsible bent stock and that it had been crudely welded at the throat at some point.

Anchors are important symbols of the maritime world and are common artefacts found on the seafloor. We have had several anchors reported to the Protocol. Unlike this example the anchor related finds reported are usually broken or fragmented parts. The most complete anchor besides this one is Hanson\_0125\_a; an extremely large admiralty anchor reported in the 2007-2008 Protocol year and is the largest find reported through the Protocol to date! There are a number of reasons why an anchor may end up on the seabed such as being lost during a storm, being fouled, as part of a shipwreck event or lost due to broken chains or ropes. Whatever the reason they came to be there, anchors are important to record and can tell us a great deal about the history of an area, where an anchorage was located, areas of danger to ships and the location of shipwrecks.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 011/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## Tarmac\_1057: Hag Stone

This stone was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. James Davies discovered it at Tilbury Wharf.

This stone was reported by wharf staff as they noticed the perfectly formed hole in the centre which could potentially be man-made. They noted that it weighed 20.8 grams and has a 40 mm diameter. The hole is approximately 10 mm wide and runs all the way through the stone.

It was suggested that it may be a stone whorl, which is object fitted onto a spindle to increase and maintain the speed of the spin. Whorls could be made of a range of materials such as bone, antler, metal, wood, ceramic, and stone. Images of the find were sent to Wessex Archaeology's find specialist Rachael Seager Smith. She was happy to consider this a 'find' but stated that it is possible to have been naturally perforated. Holes can be created by a bivalve mollusc boring into the stone and are known as 'piddock stones'. Piddocks are a strange group of clam-like shellfish that burrow into soft rocks such as clay and sandstone. The creature is able to bore a hole into a rock by locking on with a sucker-like foot and then twisting its shell to drill. Occasionally, the piddock bores through the entire stone and leaves a perfect hole, similar to this one. To our ancestors, naturally perforated stones such as this were probably quite desirable if one could be found at the right moment – it could be utilised without having to go to the faff of doing something like making the hole themselves!

Rachael stated that the weight of spindle whorls is generally weigh less than 30 grams so to not break the thread, so the weight of this stone is in line with this. However, to spin thread of equal tension it's important that the spindle remains evenly balanced so the whorl needs to spin symmetrically. It therefore needs a central perforation and unfortunately the hole in this find isn't quite in the right position.

Stone objects with perfect holes have been reported to the Protocol on many occasions. Brett\_1015 was a similar find reported in the last Protocol year (2021-2022). This find, with similar measurements to Tarmac\_1057, was suggested to be a hag stone. Also known as an adder stones, lucky stones, eye stones etc, these objects were believed to have magical properties and supposedly include a range of abilities. These include but are not limited to the ability to heal a snake bites and medical conditions; see through the disguise of a witch or fairy by looking through the

hole; protection from evil spirits; grant wishes etc. Superstitious sailors also tied hag stones with rope to their ships to prevent witches clinging to the vessel, or to swing in the wind to help break up storm clouds (<https://www.thesimplethings.com/blog/hag-stones> accessed March 2023)

Although the archaeological potential of these finds may not be immediately obvious, hag stones or similar luck charms can be found on display in anthropological museums. The Horniman Museum & Gardens, for example, has a British charms section within its World Gallery. The superstitious charms in the Horniman were collected by Edward Lovett, an avid collector of amulets and objects related to traditions and magic and many UK museums have objects from his collection. He researched, wrote, gave talks all about folklore, even curating a 1916 exhibition called 'The folklore of London' held at the Wellcome Historical Medical Museum. His book 'Magic in Modern London', about folklore and charms, was published in 1925. These charms give us a clue about the belief systems and types of danger that people wanted to be protected from (<https://www.horniman.ac.uk/story/hag-stones-and-lucky-charms/> accessed March 2023).

It is thought that this stone is too small to be a fishing weight but it could be a naturally occurring piddock stone or a hag stone either washed from a terrestrial context, or lost by superstitious sailors.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight





## Hanson\_1059: Trinket Box Lid

This lid of a trinket box was discovered in Licence Area 401/2 in the East Coast dredging region, approximately 23 km east of Lowestoft. Tom Shenton discovered it at Frindsbury Wharf.

This metal find was reported by wharf staff as being some form of decorative plate. It measures approximately 200 mm in length and 80 mm in width. Wharf staff noted that there were no visible markings on the find.

Images of the find were sent to Wessex Archaeology's find specialist Rachael Seager Smith. She said that she could see how this find may be a decorative plate as suggested by wharf staff, however it would need some means of being fitted to the item it is decorating – e.g. perforations for small nails/rivets, projecting tangs on the back that would fit through slits in cloth or leather. She couldn't see anything like this in the photos provided by wharf staff. However, she did notice a little 'lip' visible on the very edge of the find and a small (perhaps broken) projection about half-way down the left-hand long side. She suggested that this perhaps represents part of a broken hinge, meaning that it is probably a lid of a small, late Victorian or Edwardian trinket or cosmetics box. These boxes could be made completely of metal (commonly silver) or made from glass with silver lids. Cheaper metals were used for the more down-market versions with the metal being silvered or tinned to imitate the more expensive look. This was probably the case for this find.

The 18th century saw a spike in the production of trinket boxes. Trinket boxes were embellished on the top in many different designs: decorated with flowers, birds, and other delicate motifs and had a hollow space when opened. Trinket boxes have been made in a variety of different materials including gold, iron, wood, stone, porcelain, and papier mâché. The spread of porcelain ware, enamelling, and art metal gave rise to the popularity of trinket boxes, and they became a necessary item amongst the upper classes. The Industrial Revolution saw improvements in technology and the foundation of manufacturing. As a result, trinket boxes suddenly became a much more affordable and attainable item due to the overall improvement in production.

This lid is likely to be an isolated find, perhaps lost overboard from a vessel travelling around the coast of Britain. Alternatively, the find may have been broken prior to entering the marine environment and therefore disposed of overboard.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 013/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Kent



## Tarmac\_1060: Ammonite

This fragment of ammonite was discovered in Licence Area 460 in the East English Channel dredging region, approximately 14 km south of Hastings. Paul Scrace discovered it at Greenwich Wharf.

This find was reported by wharf staff as a fossil measuring approximately 35 mm long and 20 mm wide.

Images of the find were sent to Lorraine Higbee, an animal bone specialist at Wessex Archaeology. Although it was difficult, she suggested that it may be a chunk of an ammonite. An ammonite is an extinct spiral-shaped cephalopod mollusc related to squids and octopuses. The ammonite's living relative, the nautilus, can be used to picture what it may have looked like as they have similar shell shapes.

With this suggestion, the images were then forwarded to Dr Michael Simms, Senior Curator of Geology of National Museums Northern Ireland and specialist in fossils, who confirmed that it was a part of an ammonite. Michael noted that the location of the discovery in Area 460 concurs with the areas of Upper Jurassic mudstone (probably Kimmeridge Clay) offshore from Hastings. This broadly fits with the preservation style of this ammonite (including the greyish colour which is typical of Kimmeridgian mudstone). From the little fragment that we have, Michael suggested that it does rather resemble the inner whorls of an ammonite called *Pictonia*, which comes from the Lower Kimmeridge Clay, although it might be from one or two other Kimmeridgian ammonites.

Ammonites first appeared about 450 million years ago and most had died out at the same time as the non-avian dinosaurs at the end of the Cretaceous Period, 66 million years ago. Therefore, an ammonite does not technically constitute an archaeological discovery, as archaeology only studies the human past, and these creatures died a long time before even the first human species evolved. For comparison, the oldest stone tools discovered at Happisburgh in Norfolk and Pakefield in Suffolk have revealed that there was a human presence in the UK between 950,000 and 700,000 years ago.

However, it is still important that fossils are reported as some may have been used by people in the past for jewellery, ornaments or curios just as much as they are today. Ammonites are relatively common fossils found around the world and their interesting geometrical appearance has captured the human imagination throughout history,

giving rise to many origin myths and beliefs about their magical properties. Ancient Greeks saw ammonites as sacred symbols associated with the horned god, Jupiter Ammon. They called them 'Cornu Ammonis' or 'horns of Ammon', which is where the scientific name 'ammonite' is derived from. In Chinese folklore ammonites also had links to horns and were called 'Jiaoshih' or 'horn stones', as they resemble coiled rams' horns. They have also been called 'snakestones' in various cultures as they were thought to resemble coiled up snakes. This includes in areas of England where there are many different legends dating back to the seventh century of various local saints turning coiled-up snakes to stone before flinging them into the sea. There are examples of enterprising Victorians carving snake heads on complete ammonite fossils to reinforce the legend of their origin (and make them more saleable).

The believed medicinal properties of ammonites is just as ranged across the world. Ancient Greeks believed that ammonites could be used as protection from snakebites and cures for blindness, barrenness and impotence. In some parts of Scotland, ammonites were known as 'cramp stones' and were used for treating cramp in cows and also considered useful for the treatment of bites and stings.

Ammonites have been reported through the Protocol on several occasions and the majority are worn down fragments like this find. However, this find is one of the smallest fragments. The largest fragment of an ammonite reported so far is Hanson\_0545, which is almost 200 mm in length and a much larger width.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex



## Tarmac\_1061: Stone

This stone was discovered in Licence Area 509/3, approximately 27km south-east of the Essex coast. Steve Tucker discovered it at Greenwich Wharf.

This stone measures over 130 mm wide, and has a notable, off-centre hole running all the way through. Wharf staff noted the smoothness of the stone in their initial report.

Finds specialist Lorraine Mepham was shown images of the find. She stated that the hole and smoothness of the find looked completely natural and unlikely to be man-made. Holes in stones can be created by a number of natural processes and even by sea creatures. One such example of creatures with this behaviour are piddocks; These are a strange group of clam-like shellfish that burrow into soft rocks such as clay and sandstone. The creature is able to bore a hole into a rock by locking on with a sucker-like foot and then twisting its shell to drill. Occasionally, the piddock bores through the entire stone and leaves a perfect hole, similar to this one. Although Lorraine believed that this stone was naturally formed, she stated that this does not preclude its opportunistic use as a potential fishing weight of some sort. To our ancestors, naturally perforated stones such as this were probably quite desirable if one could be found at the right moment.

Stone fishing weights that are similar to this find have been reported through the Protocol numerous times. Tarmac\_0317 is one of example of this which looked similar to this find but the hole had been worked by human agency. Fishing is known to have occurred around Britain since early prehistoric times and stone fishing weights have been used up to the post-medieval periods. Finding a fishing weight is interesting from an archaeological point of view because the location of such a find can tell us where people were fishing and information about their diet.

While some objects turn out not to be an archaeological find, it is important that any discoveries of unusually shaped objects continue to be reported through the Protocol, as they may prove to be a significant archaeological discovery.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Essex

## CEMEX\_1062: Ejector



This ejector was discovered in Licence Area 137 in the South Coast dredging region, approximately 10 km south of the Needles. Richard Newbery discovered it at Leamouth Wharf.

This metal object measures approximately 170 mm in length and has a diameter of approximately 60 mm. The brass ring around the wider end of the find has several markings which include 'EJECTOR III MB/43 260'. Staff suggested that based on the markings this find could be some sort of ejector seat part.

The Implementation Team thought that the find could be ordnance related and therefore images of the find were sent to ordnance specialist Mark Khan. Mark concluded that this object is an 'Ejector' and is designed to eject the contents of a carrier rocket (such as an illuminating flare). Mark said that this object can be identified as a component part of a British Naval rocket which were employed on ships for different purposes. From its size and markings, this find is most likely from a 2" Rocket Flare. They were used in an anti-aircraft role with explosive warheads and as carriers for illuminating purposes where a flare suspended on a parachute was ejected from the rocket. The illuminating flare burned with great brilliance and could illuminate a wide area showing the presence of enemy craft or as a means of passing signals between groups. The rockets were launched from projectors and were simple unguided and unrotating in type. The name 'unrotated projectile' was a cover name to disguise the use of a rocket system and comes from the fact that the projectile was not spin-stabilized. Other types of rockets were used for air defence by being fired into the path of an attacking aircraft whilst trailing a wire that was designed to bring the aircraft down or damage it when it flew into the wire. Another type of anti-aircraft rocket projected aerial mines suspended by parachutes.

The '43' marking on this find suggests that it was manufactured in 1943 and it is believed that this piece of ordnance dates to the Second World War, meaning it could have lain undisturbed for 80 years. A variety of other finds including munitions and similar finds have previously been discovered and reported from Licence Area 137. Another ejector (CEMEX\_0986) with very similar markings 'EJECTOR III MB/43 213' was discovered and reported in 2021. It was made for the same type of rocket although the '213' marking may indicate that CEMEX\_0986 was part of an earlier batch manufactured before CEMEX\_1062. Winner of 'Best Find' in the 2018-2019 finds awards, CEMEX\_0908 is an example of a much more complete rocket with the

ejector still attached. This find had the markings 'EJECTOR No. 2 MK I/L II MB/44'. Although the markings indicate that this rocket is slightly different to CEMEX\_0908 and CEMEX\_1062, it still dates to the Second World War. Due to the abundance of related finds, Licence Area 137 is likely representative of an area that saw naval warfare or training during the Second World War.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD
- The Receiver of Wreck (Droit 018/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight



CEMEX\_0908 and CEMEX\_0986



## Brett\_1063: Bar shot

This piece of barshot was discovered in Licence Area 340 in the South Coast dredging region, approximately 8.5 km south-east of the Isle of Wight. Lewis Pilgrim discovered it at Newhaven Wharf.

This find is a small iron ball with a diameter of approximately 80 mm. There is a small hole, measuring approximately 10 mm across, which doesn't go all the way through. No weight was given.

The Protocol Implementation Team thought that the hole in the shot may indicate that this find was part of a bar shot. Images of the ball were sent to Charles Trollope, an expert in historical ordnance, who stated that it was a 3-pounder shot and confirmed that it is part of a bar shot. A bar shot is a type of cannon projectile which consists of two sub-calibre balls connected by a wrought iron bar. Bar shots were used at close range in naval warfare to shoot masts, cut the shrouds and any other rigging in order to immobilize a target ship. The weight on either end of the bar would cause the whole thing to partially rotate after it was fired out of a cannon, inflicting maximum damage on sails and rigging. Such attacks could prove devastating. However, the military usefulness of bar shots died out as wooden sail-powered ships were replaced with armoured steam ships which did not rely on sails and masts for propulsion. Without these elements, the bar shot had nothing to serve as proper targets.

Charles noted that quite a few naval battles have taken place in the waters of License Area 340 over the years but this find is most likely one from the Battle of Portland. This battle was a brief engagement during the First Anglo-Dutch War and took place between 18 and 20 February 1653. Charles noted that this example could be either English or less likely Dutch but almost certainly not French. Other finds have been reported to the Protocol which are likely related to this battle, including Hanson\_1033 which is an English 3-pounder cannonball.

Numerous examples of bar shot have also been reported through the Protocol before. The last one reported was Brett\_1045, which was also discovered at Newhaven Wharf. This shot was similarly broken off like Brett\_1063 but is much larger and was identified as a 24-pounder shot. LTM\_0578 consisted of one complete bar shot alongside two balls, similar to this find in having no bar attached but a hole where the bar would have been. Licence Area 447, in the Outer Thames Estuary, from which

these were dredged is close to the site of the Battle of Kentish Knock which was another battle in the First Anglo-Dutch War, taking place on 28 September 1652.

Shots like these are relatively common finds due to the long and extensive naval history of the United Kingdom. Over the last hundreds of years, countless naval activities and conflicts have taken place along the coast. Observing the state of the shot helps in identifying whether or not it was fired. Bar shots will usually break on impact, and it is unusual to find complete fired shots without damage. As this shot is broken it could be an indication that it was used, however we cannot be absolutely certain whether this find was fired during battle or perhaps just lost overboard. It is unlikely that this type of weapon would be shot during training exercises unlike other cannonballs.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 019/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight





## Brett\_1064: Nose Cone

This nose cone was recovered from Licence Area 340 in the South Coast dredging region, approximately 15 km south-east of the Isle of Wight. Paul Stevens discovered it at Flat House Quay in a cargo delivered by *Brittania Beaver*.

Brett\_1064 is described in the initial report as a nose cone off an aircraft. Its construction from thin iron or steel, based on the corrosion products present make this unlikely. It is approximately 210 mm long, with an approximate diameter at its base of 185 mm. The nose is rounded with no evidence to it being pointed prior to its loss. There is a small corrosion hole at the point that the nose flattens, with evidence of different rates of corrosion around the whole of the object at this point. The object is hollow with its interior containing concretion and marine growth. The corroded thinning edge of the cone is bent, and partially rolled over in places, probably from being tumbled about, either when recovered, or during its time on the seabed. There are no visible markings, or stamps on or in the surface of the object.

The images of Brett\_1064 were shared with aviation experts to confirm that it was constructed of the wrong material, being steel, rather than aluminium, and not large enough to be an aircraft nose or propellor cone. The consensus was that it was part of an item of ordnance, and most likely to be the ballistic or penetrative cap off a naval shell. These were designed to make the shell more aerodynamic or aid the penetration of the armour, and were also rounded off, as suggested by the shape of Brett\_1064. As a general rule this would be 1/15<sup>th</sup> of the calibre of the shell. The cap could be either ogival or conical in shape, and in some cases they were manufactured from aluminium. The cap could also be designed to cushion the impact of a shell in order to prevent the risk of the point of the shell shattering on impact. To aid this they could also be made of hardened steel in order to penetrate the hard face of armour and aid the penetration of the real point of the shell. This then aided the penetrating power of the shell.

It is not known how Brett\_1064 entered the archaeological record. As a piece of potential ordnance, it may have been fired in practice or anger, or lost in an accident or through the loss of the ship it was onboard, either as cargo, or part of its armaments. Therefore, any further finds of this nature should be reported through the protocol, as they may shed further light on either an unknown wreck, or on the training and conflicts between the navies of Europe during the 20<sup>th</sup> Century.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 022/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Brett\_1065: Cannonball

This cannonball was discovered in Licence Area 351 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered it Flathouse Quay Wharf.

This cannonball was reported by wharf staff. It measures approximately 70 mm in diameter, is made of iron and has some spots of damage.

Charles Trollope, an expert in historical ordnance, studied the images of the find. He deduced that is an example of an English 6 pounder ball. He said that he wasn't able to specifically date it but it was certainly from after 1700.

Cannonballs are a common find around the coast of England as, with an extensive naval history, military training and battles have taken place along this stretch of coastline for hundreds of years. The South Coast region in particular has a long history of naval activity, as a result there has been dozens of cannonballs like this find reported to the Protocol. It is not possible to say whether it was fired during training, battle or perhaps just lost overboard but finds like these with differing counties of origin may indicate sites of conflict.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 023/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight



## Brett\_1066: Metal Bracket

This metal bracket was discovered in a Licence Area 430 cargo from the South Coast dredging region, approximately 15 km south-east of the Isle of Wight. Ben Johnson discovered it at Flat House Quay in a cargo delivered by *Brittania Beaver*.

Brett\_1066 was described in the initial report as an aluminium bracket found on site, and potentially a plane part. It is a lightweight thin aluminium plate that would original have had the two ends bent forward at right angles to the body of the plate. Its current length is 370 mm, and its width is 120 mm. In its original form it would have been a plate approximately 240 mm long with two arms approximately 120 mm long. The body of the plate has six equally spaced holes in it for either screws or rivets. These do not appear to have been used. The two ends have 'keyhole' shaped cut out sections on the upper edge with lower edges cut away. One end is bent inwards, and the other is flattened outwards.

The images of this object were shared with various aircraft specialist to see if they felt it was plane related, with the general consensus being that it was unlikely but not impossible that it came off an aircraft. The general condition of this item, with the undamaged screw/rivet holes point to it being more likely to be a modern piece of debris, and that it is some form of mounting for either something like a fire extinguisher or bucket, or other piece of equipment requiring quick access from a wall or bulkhead mounting. The lack of retainers on the 'keyholes' for any kind of cover or other kind of secure fixing also pointed to it being some form of bracket mounting.

It is not known how Brett\_1066 entered the offshore archaeological record. It is currently considered an isolated object. However, it has come from an area that has had a number of aircraft related finds recently, and therefore any further finds should be reported as they may contribute to refining the identity of this find, its original function, and how it came to be on the seabed.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 023/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Brett\_1067: Machine Parts



These machine parts were discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Ben Johnson discovered them at Flat House Quay Wharf in a *Brittania Beaver* cargo.

Brett\_1067 was described as various parts that look to be engine components and control parts from an aircraft in the wharf description. It comprises a total of eight items including two engine valves, what appears to be a bearing ring, a crushed flat section of soldered exhaust pipe, part of a retaining ring, and parts of what may be control rods. The items appear to be made from a mix of metals, with a rubber cover on one of the rods recovered. No markings are visible on the recovered material.

Ewen Cameron of the RAF Museum was contacted regarding these finds. He was able to confirm that they appear to be aircraft components, though there is not enough diagnostic information to give any specific information regarding their origin. Ewen was able to identify one component as an engine valve with a diameter of 7". This size suggests it is from a radial engine, meaning it must have come from an American designed aircraft.

Though Brett\_1067 is considered an isolated cluster of finds, recent discoveries within Area 340 suggest that there is the possibly the remains of an American built, or flown, heavy bomber within the licence area. Therefore, any further discoveries should be reported through the protocol to help refine the interpretation of these discoveries.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight

## Tarmac\_1068: Top Cover



This possible machine gun top cover was discovered at Greenwich Wharf and originates from an unknown licence area. Paul Scrace discovered it whilst clearing stockpiled material from several licence areas.

This find is a truncated heavily corroded section of steel plate with folded edges, drilled holes, and a truncated slot at its damaged edge. There is an alpha-numeric sequence '303 MKII BY73738' hand punched into the upper side of the metal plate that was identified by wharf staff.

Images of the find were sent to external aircraft specialist Steve Vizard, as it was initially thought to be aircraft related. His response was that it might be part of the top cover off a Browning machine gun, as fitted to British aircraft during the Second World War; and that it might therefore have been recovered close to an aircraft crash site.

The Browning .303 (7.7 mm) Mark II was the standard gun used on British aircraft during the 1930s and the Second World War. It was adopted by the Royal Air Force (RAF) and manufactured under license by Vickers Armstrong and BSA. The design was based on the 1930 pattern belt-fed Colt-Browning machine gun with a few minor modifications. The gun was designed to be wing-mounted on the Supermarine Spitfire and Hawker Hurricane, as a fuselage mounted fixed gun in the De Havilland Mosquito, and as a hand-fired turret mounted gun in the Avro Lancaster and other British aircraft fitted with turrets. Over 550,000 were manufactured by the end of the Second World War.



Though the 303 MKII corresponds to the most common version of the gun used on British aircraft and its calibre, the other alpha-numeric code has not been identified. However, it would appear to be a serial number for the gun, as the numerical part is

too long to be an aircraft serial number, and the 'BY' does not correspond to any known aircraft suffixes as 'Y' was not used in UK military aircraft serial numbers to avoid confusion with 'X'. It may have been stamped on by a local armourer, in order to ensure it was put back into the correct aircraft or mounted on a particular aircraft, though usually they are stamped in the factory, along with other details such as the mark, description, manufacturer name or code, and year of manufacture.

Greenwich Wharf has produced similar finds related to Browning machine guns. In 2021, Tarmac\_0985 was reported to the Protocol and comprised two parts. After identification as a Browning fixed aircraft machine gun, Jonathan Ferguson, Keeper of Firearms & Artillery at the Royal Armouries Museum, Leeds. Confirmed that these parts were the barrel and breech casing of Browning .303 gun. The barrel of the gun was Mk. III while the breech casing was a Mk. II. Furthermore, in 2014 LTM\_0566 was also discovered at Greenwich Wharf and identified as the gun bolt of a Browning M2 machine gun.

It is likely to have come to be on the seafloor as a result of wartime hostilities. It may represent an isolated find comprising debris from a damaged vessel or may relate to the remains of wreckage on the seafloor. As a result, it is important that any further objects of potential archaeological interest are reported through the Protocol.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 065/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## Tarmac\_1070: Metal Ornament Fragment

This fragment of a metal ornament or badge was discovered in the head shute of the main BAD feed conveyor during maintenance, and therefore its licence area of origin is unknown. It was found by Bradley Troubridge.

Tarmac\_1070 is a worn and corroded iron fragment that appears to depict a flower. The degree of corrosion on the back suggests that it was part of a larger object, or mounted on one, as there is evidence for a relatively recent break along one edge of the find. The object appears to be cast iron, which may explain the brittle fracture it has suffered. It is approximately 120 mm long, and 80 mm wide.

The general consensus was that this was part of a larger object either comprising some form of coat of arms, or other pseudo-heraldic symbology; and that this formed part of one of the mantles, or more likely the compartment. It does appear to have many similarities with the rose and leaf found on the compartment or mound of some versions of the UK Royal Coat of Arms. With the large number of family, ship, and corporate shields and crests, it is unlikely without the discovery of the other parts of this object, that its original form will be identified. Crests have in past have not only appeared on building, and ships, but also on objects such as fire backs. The quality of the detail has also varied according to the skills of the factory/workshop producing the work, and the skills of their craftsmen.

It is not known how Tarmac\_1070 entered the marine environment, or what it was originally part of. Further finds of a similar appearance should still be reported as they may help us identify the area it originally came from, its function, and form, as these may shed light on an unknown wreck or archaeological material previously undiscovered within the licence areas.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 066/23)
- The Historic England's National Marine Heritage Record





## Britannia\_1071: Brass Key

This key was discovered in Licence Area 340 in the South Coast dredging region, approximately 8.5 km south-east of the Isle of Wight. J. Dietzel discovered it on board *Britannia Beaver*.

This brass key was reported by vessel staff. They noted that it has no specific markings, measures 115 mm in length and that the teeth have been severely worn down.

Images of the find were sent to finds specialist Lorraine Mephram. She suggested that the key looks like it was made fairly recent and is probably no earlier than 19<sup>th</sup>-century, although these post-medieval/modern keys are not always easy to pin down.

Several keys have been previously reported to the protocol. For example, LTM\_0506 is another broken brass key that was reported in 2013. This find still retained decorations on the bow of the key which was a classic and highly recognisable art deco design popularised in the inter-war years, during the 1920's. Given its size and styling, this key is likely to have been designed to unlock furniture such as a wardrobe, dresser or bureau, instead of a door. The discovery of the find offshore suggests that the item of furniture in question was situated on a vessel, though this cannot be fully confirmed.

How this key came to lie on the seabed is unknown – given the location of the dredging region it is likely to have come from a ship, though whether it was lost accidentally or deliberately disposed of overboard is not known. Its loss almost certainly caused the owner some inconvenience.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 026/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight





## Britannia\_1072: Aircraft Fragment

This aircraft fragment was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Dean Jackson and Robert Lockley discovered it on board *Britannia Beaver* in a cargo chute on completion of the load.

Britannia\_1072 is a truncated piece of aluminium box section with what appears to be the remains of a reinforcing plate section, and rows of torn out double rows of rivet holes. There are also small fragments of two other plates on opposite sides, still held in place by their rivet(s) at the opposite end to the larger plate fragment. It is approximately 570 mm long, and the box section is 60 mm across, with curved edges, and what appears to have been a square profile originally. One end appears to possibly be the original finished end of the box section with the other showing evidence of being truncated.

The lack of identifying plates, stamps, or marks means that the type or origin of the aircraft cannot be currently identified from this recovered piece. The double row of rivet holes down one side suggests it is more likely to be a stringer or internal cross bracing of some description. A stringer is a longitudinal member (i.e. in the fuselage aligned with the longitudinal axis and in wings and tail surfaces perpendicular to this axis) which gives the airframe its shape and provides the support for the skin. In fuselages, they link frames and in aerofoils they link ribs. The corrosion and the very close variations in measurement between both metric and imperial measurements, i.e. millimetres (mm), standard wire gauge (swg) or thousands of an inch (thou), used by aircraft designers during this period, the spacing and diameter of rivets, bolt holes and other spacings, combined with any drilling or stamping errors means that these do not help in identifying the origin of this fragment either. The damage to it also means that the use of rivet pitch, which might identify the manufacturer, rather than the possible country of origin, would be open to a wide degree of error.

Though this aircraft fragment is considered an isolated find, it should not be viewed in isolation but potentially as part of a larger debris field or crash site whose location may be undocumented and unreported. Therefore, further finds should be reported as they may lead to the discovery of a previously unrecorded crash site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 27/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Britannia\_1073: Small Gas Cylinder

This small gas cylinder was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Dean Jackson and Robert Lockley discovered it on board *Britannia Beaver* on top of the cargo whilst taking ullages.

This find is the extant remains of a small, truncated gas cylinder approximately 250 mm long and 50 mm in diameter, with an overall length including the valve and gauge of 340 mm. The gauge is missing its glass and face, with the needle and a possible Bourdon tube mechanism visible. The valve is operated by a knurled tap handle with the vent through the centre of it. On the neck of the valve, and partially covered by a concretion are the letters [..HOICHEM..] and [..AND], the first being 'The Ohio Chem[ical] & MFG Co.' and the second word being 'Cleveland'. The gauge was made by the Clapp Instrument Company and showed psi readings. It appears to be a mix of metals including steel and brass. It has the remains of a rubber or similar material hose attached to the vent through the tap handle.

This find was identified as a pilot's emergency oxygen cylinder of British origin by Steve Vizard of Airframe Assemblies. Further research by Alistair Byford-Bates of Wessex Archaeology suggests that it is an H-1 emergency oxygen cylinder or 'bailout bottle'. This would be carried in a canvas bag that was strapped to the leg of the airman, to their parachute harness, or in some cases tucked in their boot tops. It would be charged to around 1800 psi (124 bar) and give around ten minutes breathing time. A hose connector, or simple mouthpiece, in some case made of wood, would have been attached to this to breathe from. They came into service for the United States Army Air Force (USAAF) around October 1941, and were obsolete four years later with their replacement by the Type H-2 model.

It is not known how it entered the offshore archaeological record. As a piece of individual aircrew equipment from the Second World War it is presumed that it is related to the loss of an Allied aircraft from this period, and that further material related to it may be present within the area.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 028/23)
- The Historic England's National Marine Heritage Record



## Britannia\_1074: B7 Bomb Shackle

This bomb shackle was discovered in Licence Area 340 in the South Coast dredging region, approximately 12 km south-east of the Isle of Wight. Dean Jackson and Robert Lockley discovered it on board *Britannia Beaver* lying on top of the cargo whilst taking ullages.

Britannia\_1074 is the corroded and damaged remains of a B7 bomb shackle. This identification is based on the reference marks [TYPE-B-7] [100-1100] and [FRONT] pressed into the side plates. It still has some of the rivets holding the separate parts together, but reference to original drawings/images show that it has lost a number of bolts/rivets, and possibly the springs from the internal mechanisms. There is also no evidence of the red paint that was frequently applied to the front end of the shackle to ensure no confusion when working with it. It is approximately 400 mm long.

They were mounted horizontally on the vertical beams in the bomb bays of B17s, B24s, and B25s. The shackle 'jaws' at each end locked around rings on the bomb and were 'tripped' electronically. The two 'levers' just visible in the centre on the image below were the locking latches. Until modifications to the system, in late 1943, it was quite common for a bomb to 'hang up' on the shackle. Each bomb was winched into position, with the two latches closing the jaws over the suspension lugs welded to the bomb casing. The arming wires were then connected from the aircraft's electrical circuit to the bomb fuse train, and the safety pins inserted, to prevent the fuze impellers from turning and arming the bomb. Before the approach to the target, the pins were removed from each bomb, thus 'arming' them. When bomb release was triggered the servo on each shackle pushed against a detent which opened the jaws releasing the bomb. As the bomb fell clear, the wires to the fuze chains pulled out which allowed the impellor to start spinning arming the fuze.

It is not known how it entered the offshore archaeological record. However, as fixture from a Second World War heavy bomber it can be presumed that it is related to the loss of one of these aircraft, and that further material may be present within the area.



Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 029/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Hanson\_1075: Anchor Head

This anchor head was discovered in Licence Area 240 in the East Coast dredging region, approximately 10 km south-east of Great Yarmouth. Dave Brown discovered it on board *Arco Avon*.

This find is a broken head of a wrought iron anchor. It is corroded, missing the shaft and measures approximately 530 mm across.

Images of the anchor were sent to members of the Coastal & Marine team at Wessex Archaeology. Senior Marine Archaeologist Graham Scott described it as a fisherman-type small stocked wrought iron anchor with rounded arms and a welded joint between crown and stock. It is not clear whether the palms have broken off at the weld or have corroded away to stubs. Overall, this anchor has a very simple form. Only a stub of the stock has survived, suggesting that it has probably broken at the throat due to mechanical force. Senior Maritime Archaeologist Alistair Byford-Bates agreed and stated that this find was the remains of a wrought iron anchor with either hammered and truncated or now lost flukes. The shank appears to have either been eroded away or snapped off with the stump/broken end eroded over time at the throat of the anchor. It was hammer welded together. Date wise it is difficult to refine any practical range beyond that it is probably medieval/post-medieval. Iron anchors were said to have been forged in East Anglia from at least 573 AD, though Alistair noted the possibility of Roman forged anchors predating that made in the UK. The profile of this anchor head however doesn't chime with any of the obvious medieval anchors out there for comparison, which suggests it is likely post-medieval in date. Alistair said that it could be between 16th to 19th century in origin, but to refine this date to any degree it would need metallurgical analysis.

Anchors are important symbols of the maritime world and are common artefacts found on the seafloor. We have had several anchors reported to the Protocol. Like this example the reported anchor related finds are usually broken or fragmented parts. There are a number of reasons why an anchor may end up on the seabed such as being lost during a storm, being fouled, as part of a shipwreck event or lost due to broken chains or ropes. Whatever the reason they came to be there, anchors are important to record and can tell us a great deal about the history of an area, where an anchorage was located, areas of danger to ships and the location of shipwrecks.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 021/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Britannia\_1076: Aircraft Fragment

This aircraft fragment was discovered at Flathouse Quay, Portsmouth by Paul Stevens in a Licence Area 340 dredged by Britannia Beaver. Licence Area 340 is approximately 12 km south east of the Isle Wight in the South Coast dredging region.

Britannia\_1076 is the remains of a lightweight metal, probably aluminium, bracket, with a series of holes drilled in it. It has one surviving rivet still in place. It is approximately 440 mm long and 100 mm wide showing signs of being truncated at both ends. It has three approximately 20 mm diameter holes suggestive of having plates or flanges bolted to them. There are no visible identification marks or stamps. It appears to have come from an aircraft, based on its form and construction material. The long edge on one side appears to have been originally formed to give additional longitudinal strength to it by being at an angle to the rest of the piece.

The lack of identifying plates, stamps, or marks means that the type or origin of the aircraft cannot be currently identified from this recovered piece. The corrosion and the very close variations in measurement between both metric and imperial measurements, i.e. millimetres (mm), standard wire gauge (swg) or thousands of an inch (thou), used by aircraft designers during this period, the spacing and diameter of rivets, bolt holes and other spacings, combined with any drilling or stamping errors means that these do not help in identifying the origin of this fragment either. The damage to it also means that the use of rivet pitch, which might identify the manufacturer, rather than the possible country of origin, would be open to a wide degree of error.

Though this aircraft fragment is considered an isolated find, it should not be viewed in isolation but potentially as part of a larger debris field or crash site whose location may be undocumented and unreported. Therefore, further finds should be reported as they may lead to the discovery of an unknown crash site.



Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Brett\_1077: Cannonball

This cannonball was discovered in Licence Area 340 in the South Coast dredging region, approximately 8.5 km south-east of the Isle of Wight. Paul Stevens found it at Flathouse Quay Wharf.

This large iron cannonball was reported by wharf staff. It has a diameter over 160 mm and has sustained some damage and corrosion all over its surface.

Images of the find were sent to historical ordnance specialist Charles Trollope. He described this as a simple one to identify, but that this causes a problem. This is an English 7.8" cannon ball cast for an 8"/68 pounder gun. However, this only entered English use in 1821 and this cannon ball is almost certainly 17th century likely originating from a conflict within the First Dutch war and it is not the first to be found. He said that he could only think that they were being fired out of the standard 8" Perrier which was designed to fire stone shot of this size weighing 24 pounds. There is no record of anything else in the gun lists.

Cannonballs are a common find around the coast of England as, with an extensive naval history, military training and battles have taken place along this stretch of coastline for hundreds of years. The South Coast region in particular has a long history of naval activity, as a result there has been dozens of cannonballs have been reported to the Protocol. It is not possible to say whether it was fired during training, battle or perhaps just lost overboard but finds like these with differing counties of origin may indicate sites of conflict.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Isle of Wight



## Hasnon\_1078: Animal Bones

These bones were discovered at Hanson's Dagenham Wharf by Tye Bealing. The licence area of their origin is unknown as they were found at the Wharf in mixed cargo.

These two fragments of large bones were discovered and given to archaeologists whilst conducting operational sampling at Dagenham wharf. They are eroded and 100 mm and 80 mm across, respectively.

The bones were brought back to Wessex Archaeology's Salisbury office for further assessment and were given to Zooarchaeological specialist Lorrain Higbee to examine. She concluded that the larger of the two was an eroded vertebrae that would belong to a mammoth, whilst the smaller bone was an unidentifiable fragment belonging to a large mammal. Both were heavily eroded and would not be possible to get an exact date of origin.

Animal remains may end up in marine contexts having been washed from terrestrial deposits by rivers or eroded from cliffs or beaches. Alternatively, they may date to a time when the seabed was dry land. During the last 2.5 million years, there have been numerous cold periods, called 'glacials', where large ice sheets covered much of Britain and most of the North-West European Peninsula. During the height of the last ice age, known as the Devensian (c.18,000 years ago), it has been estimated that the sea level was approximately 120 m lower than it is today, exposing areas of the North Sea as dry land. This would have been prime land for our ancestors and the animals they hunted. Licence areas such as 240, which has become known for producing lots of prehistoric animal remains and flints, became fully submerged around 10,000 years ago as the Ice Age ended, and water was released from the ice caps. Although we don't know exactly which area these bones came from, Hanson's Dagenham wharf receives many cargoes it may be from one of those related to the now submerged Palaeo-Yare river valley.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record



## Hanson\_1079: Metal Drum Cap

This metal drum cap was discovered by Tye Bealing in a Licence Area 240 cargo from the East Coast dredging region, approximately 12 km south-east of Great Yarmouth at Dagenham wharf in the oversize stockpile.

Hanson\_1079 appears to be a slightly crushed and corroded drum/container or outlet cover. Based on the visible 'threads', and its stamped metal construction it is probably early to mid-20th Century in origin. It has a series of cut outs on its lower rim edge suggestive of it being crimped closed over a raised lip. The design of the inside rim of the dome also suggests that it was designed to maintain a liquid tight seal. It may also have fitted within a clamp that sealed it down onto the neck or top of the container it closed.

Due to the degree of corrosion on this find there are no visible stamps or marks to link it to a specific manufacturer, or usage. Currently no similar design has been identified.

As with all finds, though recovered in isolation it may be indicative of other archaeological material within the area related to a wreck, though currently it is not known how this find originally entered the archaeological record.



Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 095/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk





## Brett\_1080: Aircraft Fragment

This aircraft fragment was discovered at Flat House Quay, Portsmouth by Nathan O'Sullivan in a cargo from Licence Area 340 dredged by *Britannia Beaver*. Licence Area 340 is approximately 12 km southeast of the Isle Wight in the South Coast dredging region.

Brett\_1080 is the remains of a lightweight metal, probably aluminium, bracket and box section. It has a row of double rivets holding the remains of a bracket or plate in place on one side. It is approximately 370 mm long and 90 mm wide showing signs of being truncated at one end. The opposite end where the bracket is mounted appears to have two half sections cut out, possibly where it butted up against a tubular frame. A second set of double rivet holes is visible on the opposite side to the bracket, suggesting that two plates bracketed the tube that the box section butted against. There are no visible identification marks or stamps, but there is what appears to be black paint with a yellow primer visible on it.

The lack of identifying plates, stamps, or marks means that the type or origin of the aircraft cannot be currently identified from this recovered piece. The corrosion and the very close variations in measurement between both metric and imperial measurements, i.e. millimetres (mm), standard wire gauge (swg) or thousands of an inch (thou), used by aircraft designers during this period, the spacing and diameter of rivets, bolt holes and other spacings, combined with any drilling or stamping errors means that these do not help in identifying the origin of this fragment either. The damage to it also means that the use of rivet pitch, which might identify the manufacturer, rather than the possible country of origin, would be open to a wide degree of error.

Recent unpublished research by Historic England with the Fleet Air Arm Museum has shown that aircraft paints can be traced to specific aircraft companies and factories, even when it is the same basic colour. However, this would require further research, including creating a reference collection, as there are currently no central databases of these paints to cross reference to.

Though this aircraft fragment is considered an isolated find, it should not be viewed in isolation but potentially as part of a larger debris field or crash site whose location may be undocumented and unreported. Therefore, further finds should be reported as they may lead to the discovery of an unknown crash site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Tarmac\_1081: Cattle Bone

This cattle humeral bone was discovered in a Licence Area 351 cargo from the South Coast dredging region, approximately 40 km east of the Isle of Wight. James Davis discovered it at Tilbury Wharf.

This fragment of large animal bone was discovered at Tilbury Wharf by James Davis from licence area 351 in the South Coast dredging region.

The images were sent to Wessex Archaeology's Zooarchaeologist Lorrain Higbee who identified it as the distal end, i.e., the furthest away end, of a cattle humerus. There did not appear to be any evidence of butchery or other cut marks from the available images. The lack of mineralisation suggests that, archaeologically, it is relatively recent in origin.

It is not clear Tarmac\_1081 entered the offshore archaeological record. The most obvious reason is that it formed part of the diet of the crew of a vessel and was discarded overboard once finished with. The second possible reason is that it formed part of the cargo of an unknown vessel that foundered, with the cargo becoming exposed and dispersed over time. As this may be indicative of an unknown wreck or other archaeological material, further finds of this nature should continue to be reported through the Protocol.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight





## Hanson\_1082: Cannon Ball

This cannon ball was discovered in Licence Area 473 in the South Coast dredging region, approximately 25 km south-east of Newhaven. David Brown discovered it on board *Arco Avon*.

Hanson\_1082 is the heavily corroded remains of a cannon ball measuring approximately 6.5"-7" or 162-175 mm in diameter (the damage means it is elliptical in shape). We do not have the weight of it for reference. It shows signs of being partially buried for some time, based on the marine growth on one side, and the almost black 'buried' portion. However, the damage on all sides indicate that it has suffered active corrosion for a significant amount of time based on the areas of lost corrosion products, and the reduction in size it has undergone. The spalling on the dark areas also suggest that it has suffered from drying out at some point, leading to fragment separating from the main part of it. This implies that it has been moved about on the seabed over time. The corrosion products make an accurate estimation of its diameter difficult.

Due to the degree of damage the size of gun this came from is not clear, but it appears to post-date the standardisation of ordnance by Borgard in the early-18th Century, though due to the ubiquitous nature of their design, it is difficult to accurately date cannonballs with any certainty, since cannons have been mounted on ships since the 14th century in NW Europe. Three possibilities for the gun that fired it, based on this assumption, are the 42-pounder short or long gun, or the 42-pounder carronade, all with a shot diameter of 6.68" or 180 mm. The issue of dating cannon balls is compounded by the wide variation in designs and calibres of the cannons that fired them and the lifespan of these weapons, with obsolete designs often still in use on merchant ships long after they had fallen out of service with the various navies of Northern Europe, who also used captured prize weapons on their vessels.

This cannon ball is currently considered an isolated find. However, any further discoveries should continue to be reported through the Protocol, as they could shed light on periods of naval conflict or a possible unknown wreck site.

### References:

- Brown, R.R., 1997. Arms and Armour from Wrecks: An Introduction. In: Redknapp, M. (Ed), 1997. *Artefacts from Wrecks*. Oxbow Monograph 84. Oxbow Books, Oxford.
- Carpenter, A.C., 1993. *Cannon. The Conservation, Reconstruction and Presentation of Historic artillery*. Halsgrove Press, Tiverton.
- Von Arbin, S., Douglas Smith, K., and Skowronek, T.B., 2023. The Marstrand Cannon: the earliest evidence of shipboard artillery in Europe? *The Mariner's Mirror* 109(3), pp. 260-282.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 036/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for East Sussex



## Brett\_1083: Naval Ordnance Component

This naval ordnance component was discovered at Flat House Quay, Portsmouth by Kevin Ferguson Snr. in a cargo from Licence Area 340 dredged by *Britannia Beaver*. Licence Area 340 is approximately 12 km southeast of the Isle Wight in the South Coast dredging region.

This small mixed metal object (measuring approximately 100 mm in length by 80 mm in width) appears to be the damaged remains of a spring-loaded release mechanism broken off from the system it was part of. It appears to have a large heavy-duty spring through it with some form of release on the outside of the quadrant. No visible markings, stamps, or other identifiers have been found on it.

The images were shared with a number of specialists who felt that it was either possible part of a torpedo, or more likely part of a ship's ordnance systems. This is based firstly on it being made of brass or bronze and designed to slide into some form of slideway before being clamped in place. Secondly, the quadrant piece is cast to the body, and the teeth of the quadrant look like a gear wheel locates into them based on the slightly curved tooth form. This suggests that perhaps it was part of a range finder or something similar that rotates on a gun mounting.

The lack of identifying plates, stamps, or marks means that the type or origin of this find cannot be currently identified from this recovered piece. The corrosion and the very close variations in measurement between both metric and imperial measurements, i.e. millimetres (mm), standard wire gauge (swg) or thousands of an inch (thou), used by during this period means that these do not help in identifying the origin of this fragment either.

Though this potential naval ordnance systems fragment is considered an isolated find, it should not be viewed in isolation but potentially as part of a larger debris field whose location may be undocumented and unreported. Therefore, further finds should be reported as they may lead to the discovery of an unknown wreck site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for the Isle of Wight



## Tarmac\_1084: Ship's Badge

This ship's badge was discovered in a Licence Area 127/1 cargo in the South Coast dredging region, approximately 30 km west of the Isle of Wight. Dan Powell discovered it on board the *City of Chichester*.

This fragment of a naval badge was identified through research by Wessex Archaeology's Coastal & Marine team members Paolo Croce and Graham Scott. It is the badge from the American Submarine Squadron 4, also known as SUBRON 4, or CSS-4. It does not appear to relate to a specific submarine from this squadron but is instead the unit badge.

Originally based in the Pacific at Pearl Harbour between 1930-45 the squadron was transferred to the US Atlantic Fleet and based in Key West between 1945-59, where they were known as the 'Sunshine Squadron', before moving to Charleston South Carolina prior to deactivation in 1995. They became known as the 'Swamp Fox' squadron during this later deployment. This was in reference to Francis Marion; an American Revolutionary War leader nicknamed the 'Swamp Fox'. The squadron was subsequently reactivated in 1997 in Groton, Connecticut. Based on this the badge potential dates to between 1959-95, though how and when it reached the English Channel is not known. A short review of their history prior to being reactivated can be found [here](https://archive.navalsubleague.org/2005/decommissioning-the-swamp-fox-squadron-gone-but-never-forgotten) (<https://archive.navalsubleague.org/2005/decommissioning-the-swamp-fox-squadron-gone-but-never-forgotten>).

Though a direct example of the original badge has not been found through research, recent versions have been found on cloth patches and cigarette lighters showing the fox in one quadrant, a palm tree and quarter moon in another with the silhouette of a modern submarine and SUB RON 4 in the top half of the badge. 'Swamp Fox' appears in a scroll centred between the lower quadrants. The edge of the scroll, the fox, the rear half of the submarine, and the 'N' from SUBRON 4 are all visible on the fragment recovered.

How, or when, this badge entered the marine environment is not known, particularly as the Squadron in question do not operate in waters around the UK or appear to visit the region in the publicly available sources. It is possible that the badge was a gift during a personnel exchange or port visit, and then subsequently damaged and lost, though there is no record for this occurring. It is therefore considered an isolated find, but any similar finds should be reported through the protocol as they may help to identify either how it ended up in the sea, or additional material related to it.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 045/23)
- The Historic England's National Marine Heritage Record



## Cemex\_1085: Engine Fragment

This possible engine fragment was discovered by Martin Keeble who found it at Angerstein wharf, Greenwich. It is from Licence Area 251 in the East Coast Dredging region approximately 6 miles offshore from Lowestoft.

Cemex\_1085 appears to be a fragment of an engine or gearbox casing with 'ZM24' visible on its surface, and four spring loaded fasteners or clevis pins. These appear to be through the casing itself, on what appears to be the remnants of a cooling fin, and on the edge of the object. There appears to be some form of oil/fuel feed pipe, possibly made of brass protruding into the centre of the circular, and truncated, cavity formed in the casing. This is approximately 90 mm across, with the overall length of the object approximately 500 mm long, and 350 mm wide. From the images all sides of the object are damaged.

Images from this find were shared with aviation experts from the Fleet Air Arm Museum, and Steve Vizard from Airframe Assemblies. Based on the available images they felt that this find appears to be part of the engine or gearbox casing from an aircraft that has either suffered some form of violent explosion or crashed at very high-speed causing its disintegration. No specific engine type has been identified at this time. Searches to identify or cross reference the 'ZM 24' have currently been unsuccessful, though this is currently the best option for identifying the origin of these parts and the aircraft they are from.

Though this aircraft fragment is considered an isolated find, it should not be viewed in isolation but potentially as part of a larger debris field or crash site whose location may be undocumented and unreported. Therefore, further finds should be reported as they may lead to the discovery of an unknown crash site.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck
- The Historic England's National Marine Heritage Record
- The HER for Suffolk





## CEMEX 1086: Timber

This piece of timber was discovered during an archaeological operational sampling visit at Cemex's Dagenham wharf, in a cargo dredged by *Reimerswall* from Licence Area 513/1 in the East Coast dredging region, approximately 18 km east of Great Yarmouth.

This find consists of two pieces of timber, both with some superficial rust staining. The larger piece is around 120 mm long, 110 mm wide and 80 mm deep, and is roughly squared in shape. The smaller is cylindrical, 85 mm long with a 25 mm diameter.

When the archaeologists from Wessex Archaeology were undertaking the operational sampling visit at Cemex's Dagenham wharf, it was initially thought that the larger of these objects could be a fragment of a ship's timber, while the smaller could be a part of a treenail. At the time of finding, the objects were still together, but the possible treenail could be removed. On closer inspection it appears more likely that these are natural objects. Treenails were used extensively as fixtures in vessels of all sizes, from small cutters to ships of the line like the *Victory*. The rough shape of the larger timber suggests that if it is a piece of ships timber it is from a ships frame. On more rough and ready craft these could sometimes be less aesthetically finished as outwardly visible planking. The curves needed in framework meant that these pieces would be taken from the naturally occurring bends and curves present in a tree's structure.

However, much more likely is that both items are naturally occurring objects. However, timber pieces with interesting shapes, particularly if they indicate evidence of fastenings (whether wooden treenails, metal nails, or even holes where the fastenings used to be) should be reported through the Protocol – as these types of finds could indicate the presence of a previously undiscovered wooden shipwreck.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The MOD (if relevant)
- The Receiver of Wreck (Droit 068/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Norfolk



## Hanson\_1088: Pottery Fragment

This piece of pottery was discovered in a Licence Area 401/2A cargo from the East Coast dredging region, approximately 25 km south-east of Great Yarmouth. It was discovered during operational sampling at Dagenham Wharf.

Hanson\_1088 is a small fragment of pottery discovered during archaeological operational sampling at Dagenham in the oversize fraction of an Area 401/2A cargo dredged by *Arco Dijk*. The piece measures approximately 45 mm by 40 mm. The lack of any form to this fragment, apart from the grooves on one side, make it difficult to be sure about its form or use, though the grooves are suggestive of the keyed grooves on flue tiles for holding mortar.

Pottery specialists at Wessex Archaeology were consulted regarding the find. They concluded that the find was a fragmentary piece of Modern Construction Building Material (CBM). The lack of markings present on the find make exact dating impossible but it is likely to date to the nineteenth century.

It is not clear how this fragment of pottery entered the archaeological record. It might have been discarded overboard as a broken, and no longer usable object from the personal effects of a ship's crew, or it may be part of the cargo of a lost vessel.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 117/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk







## Hanson\_1089: Railway Dog Spike

This railway dog spike was discovered in a cargo from Licence Area 401/2A from the East Coast dredging region, approximately 25 km south-east of Great Yarmouth. It was discovered during operational sampling at Dagenham Wharf.

Hanson\_1089 is a railway spike or dog spike, measuring approximately 150 mm in length by 40 mm in width at the head. It is made out of a single piece of what appears to be cast iron or steel. Cast iron spikes are considered strong and durable, making them ideal for use in high-traffic areas. They are also resistant to wear and tear, making them suitable for use in harsh environmental conditions. However, they have a disadvantage of being relatively heavy compared to other materials used in manufacturing spikes. They were generally made by cutting the spikes from a rod of steel or iron and shaping them to have the square shank and tapered point. They were also cast, with the two methods having various advantages or disadvantages.

The spikes were made with an offset head to secure rails and base plates to railway ties or sleepers. Robert Livingston Stevens is credited with the invention of the rail spike, the first recorded use of which was in 1832. At that time, English mainline use railways used heavy and expensive cast iron chairs to fasten 'T'-shaped rails to the wooden sleepers, while Stevens came up with an idea to add a supporting base to the 'T' rail that is then fixed with a simple spike. Common sizes are from 14-16 mm square and 140-150 mm long. The spikes are roughly chisel-shaped with a flat edged point. It is driven with the edge perpendicular to the wood grain of the sleeper, which along with their profile gives greater resistance to loosening. Their main function is to keep the rail in gauge so are not normally required to provide a strong vertical force, this allows the rail some movement in the horizontal plane for expansion and contraction. The advent of concrete sleepers has meant that screw spikes are now more common.

How Hanson\_1089 entered the marine archaeological record is not known. It is likely to have been lost as part of a ship's cargo, or perhaps in some secondary role outside of the railway or mining industry from which it probably originates. As with all such finds, any further discoveries should be reported through the Protocol to help us further understand such discoveries.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- The Receiver of Wreck (Droit 117/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



## Hanson\_1090: Cattle Rib Bone

This cattle rib bone was discovered in a Licence Area 401/2 cargo from the East Coast dredging region, approximately 25 km south-east of Great Yarmouth. It was discovered during operational sampling at Dagenham Wharf.

Hanson\_1090 was identified by Wessex Archaeology's Zooarchaeologist Lorraine Higbee as a cattle rib bone, measuring approximately 200 mm in length. Its condition and lack of mineralisation suggest that it is relatively recent in age. The distal end has been broken off at some time, and the proximal, or head end, has been worn down and abraded from being on the seabed. Cattle generally have 13 pairs of ribs that articulate across two contiguous vertebrae, and connect to the sternum by cartilage at their distal ends. It probably entered the maritime environment, either as rubbish from a passing vessel; as part of the cargo of a vessel that foundered, either as a live export, or as a carcass 'on the hook'; or it is from an animal carcass that was washed out to sea, either from falling into the water and drowning, or by being dumped.

This bone, though significantly smaller in dimensions to the bones recovered from the Palaeolithic period that we normally look for during operational sampling visits, is related, with all modern cattle tracing their lineages back to their ancestral species, the Aurochs. The different lineages to join these together is needless to say complicated, not fully understood, subject to missing 'sections' in the family tree, and still open to much debate amongst specialists. It has also been subject to the effects of human interference in the last 10,500 years as humans have domesticated wild cattle, and then bred them for their desirable traits, including with closely related species, so further confusing their lineages.

As stated above it is not clear how Hanson\_1090 entered the marine archaeological record. It is therefore recommended as with all such finds that they are reported through the Protocol in order to help inform our understanding of the regions archaeological record, and to possibly identify previously unknown wrecks or archaeological deposits.

Information about this discovery has been forwarded to:

- Historic England
- BMAPA
- The Crown Estate
- Receiver of Wreck (117/23)
- The Historic England's National Marine Heritage Record
- The Historic Environment Record for Suffolk



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